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Nutrition Baseline Survey Ethiopia

For the Global Programme Food and Nutrition Security, Enhanced Resilience
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Annex

Abbreviations

BMZ	Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung
EDHS	Ethiopian Demographic and Health Survey
FAO	Food and Agriculture Organization of the United Nations
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
IDDS-C	Individual Dietary Diversity Score for Children
IDDS-W	Individual Dietary Diversity Score for Women
IYCF	Infant And Young Child Feeding
KAP	Knowledge, Attitudes and Practices
MAD	Minimum Acceptable Diet
Md	Median
MMD	Minimum Dietary Diversity
MMF	Minimum Meal Frequency
NBS	Nutrition Baseline Survey
NGO	Non-Governmental Organization
NSAP	Nutrition Sensitive Agriculture Programme
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
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 880 000 women, 235 000 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.

Bonn, September 2016
Michael Lossner

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1. EXECUTIVE SUMMARY

This is a summary of the nutrition baseline survey (NBS) conducted within the scope of the Global Programme Food and Nutrition Security, Enhanced Resilience by the German Ministry of Economic Cooperation and Development. The survey aimed to define the nutrition situation of the studied population and the collected data serve as baseline information for up-coming projects and activities coordinated by GIZ and partners.

The survey was conducted among women of reproductive age with their children 6-23 months of age in the Tigray Region, Ethiopia, in January 2016. The survey included 400 households from 17 randomly selected villages in the three woredas Kola Tembien, Lalaey Adiabo, and Ganta Afeshum. The survey collected data on socio-demographic information, agriculture, sanitation and hygiene, food security status, childcare and feedings practices, dietary intakes of children and women, nutritional knowledge of women, and hygiene behavior. In regard to dietary intake, minimum dietary diversity (MDD) and individual dietary diversity score (IDDS) of women were calculated based on a 24h qualitative dietary recall and a ten food groups classification. Minimum acceptable diet (MAD) for young children was calculated based on a 24h qualitative dietary recall and seven food group classification. Food security status was assessed with the Household Food Insecurity Experience Scale.

A total of 398 households were included in the overall analysis. Mean age of mothers was 28±7 years and of children 13±2 months. The majority of women was married, almost all were Christian and had male headed households. Less than half (44.5%) of the women was literate. Mean number of income sources was 2.4±1.1. Most cultivated crops were maize, teff, barley, and legumes. Around 70% had home gardens. Vegetables were mainly grown during the rainy season. Storage and processing of vegetables was conducted by only 11.1% of the studied households. Almost 95% of respondents were keeping livestock whereas only 26.4% had access to fruits or fruit trees.

In regard to sanitation and hygiene, 82% had access to improved drinking water during rainy and dry season. An improved sanitation facility was only available for 12.3%; 51.5% were practicing open defecation. Around 66% stated to wash their hands with soap after defecation. As reported by mothers, 31.2% of children had diarrhea within the two weeks prior to the survey. Mean number of visits to the under-five clinics was 4.2±1.1 and of antenatal care was 4.1±1.4. Overall, 88.4% and 80.9% of respondents received hygiene and nutrition counselling.

In regard to food security, 32% were considered as food secure. Almost 49% were mildly food insecure, 18% moderately food insecure, and 1% severely food insecure.

Mean IDDS of women was 3.1±0.9. Overall, 6.8% achieved MDD. Most consumed food groups were “grain, roots and tubers”, “legumes”, and “other vegetables”. Among all children, 17.1% achieved MAD. For MAD, the most challenging factor was dietary diversity and not feeding frequency. Here, most consumed

food groups were “grains, roots, and tubers”, “legumes, nuts, and seeds” as well as “other vegetables and fruits”. Figure 1 presents a summary of major findings of the current NBS in relation to the food and nutrition security framework.

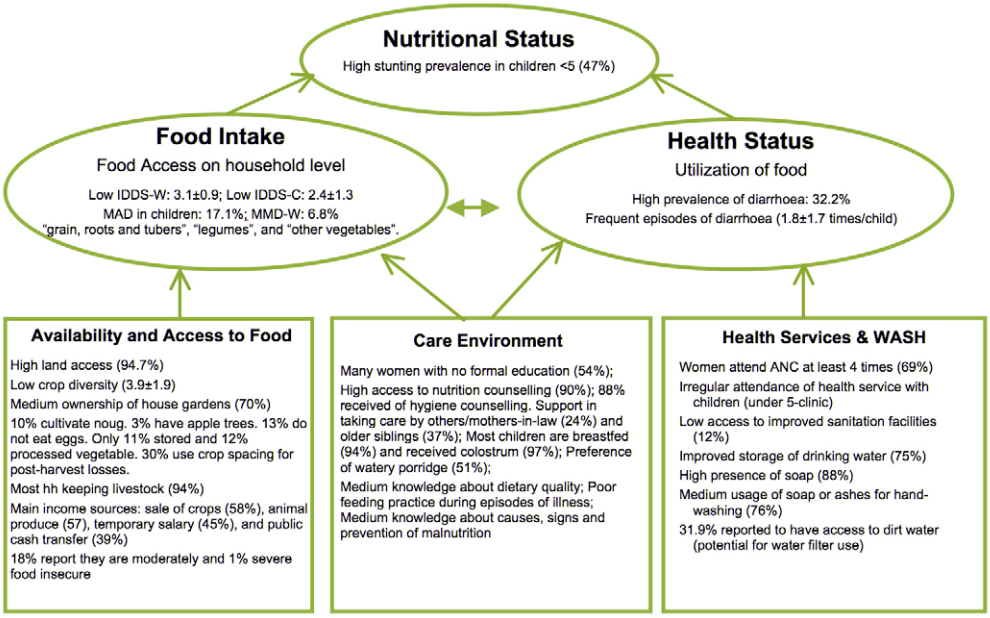

Figure 1: Results of the NBS presented according to the UNICEF Model

2. BACKGROUND AND OBJECTIVES

2.1. Country Context

The Federal Democratic Republic of Ethiopia is a landlocked country located in the Horn of Africa surrounded by six countries, namely Eritrea, Djibouti, Somalia, Sudan, South Sudan, and Kenya. Ethiopia comprises an area of 1,104,300 km² and has a population of about 90 million. Its capital Addis Ababa has about 3.3 million inhabitants. Overall, the urban population accounts for 19.5%(1). Ethiopia is divided into nine regional states and two cities administrations(2). Around 36% of the land is used for agriculture. The agriculture sector makes up almost half of the GDP and around 80% are employed or work in the agriculture sector. Major crops are coffee, cereals, legumes, and oilseeds among others. Livestock keeping is common and subsistence farming based on access to rain-fed land is the most practiced form of agricultural production. Major environmental problems are deforestation, overgrazing, soil erosion, desertification, water shortages in some areas due to water-intensive farming and poor management(1).
Although Ethiopia's economy has been improved, it remains one of the poorest countries. According to the 2015 Human Development Report (UNDP), Ethiopia is ranked 174 out of 188 countries(3). In the latest Mini Ethiopian Demographic Health Survey (EDHS) 2014, more than half of the interviewed households had access to improved drinking water and only 4% to improved sanitation facility(4)Ethiopia","event-place":"Addis Ababa, Ethiopia","author":[{"literal":"Central Statistical Agency [Ethiopia]"}],"issued":{"date-parts":[["2014"]]}}],"schema":"https://github.com/citation-style-language/schema/raw/master/csl-citation.json"} . Among the rural population, 48.6% have access to improved drinking water and 28.2% to improved sanitation facility(1). Only 6% of rural households had access to electricity. In regard to the literacy rate, 48% of women in the reproductive age group had no formal education(4). The mother's level of education is one important factor to influence feeding habits and nutritional outcomes among young children. In the EDHS 2014, there was an inverse relationship with the educational level and stunting (chronic malnutrition) levels. In this survey, 40% of children under age five were stunted, and 19% of children were severely stunted. In rural areas, 42% of children under five years of age were stunted. According to the World Health Organization (WHO), stunting rates >40% classify a severe public health and nutrition problem(5). In regard to wasting, acute malnutrition, 9% of children were wasted, and 3% were severely wasted(4). Overall, 25% were underweight and 7% were severely underweight, with a higher percentage among rural children. In the survey of 2011, 27% of women of reproductive age were thin or undernourished (BMI <18.5 kg/m²), 6% were overweight or obese (BMI >24.9 kg/m²), whereas the remaining percentage were in the normal weight range(6).

A secondary analysis of the Ethiopian Demographic Health Survey 2011 showed that only 10.8% and 44.7% of children between 6-23 months of age achieved minimum dietary diversity and minimum meal frequency(7)"container-title":"Journal of Nutrition and Metabolism","volume":"2013","source":"PubMed Central","abstract":"Background. Appropriate complementary feeding practice is essential for growth and development of children. This study aimed to assess dietary diversity and meal frequency practice of infants and young children in Ethiopia. Methods. Data collected in the Ethiopian Demographic and Health Survey (EDHS. In a working paper from IFPRI (2015), mean dietary diversity score by women was 1.56 based on a nine food group scale(8). Generally, food intake mainly consists of cereals such as teff, wheat, maize, as well as tubers and roots, legumes, and oil seeds(9).

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 (Figure 2) by using the same survey tools. The programme in Ethiopia focuses on community-based measures to promote nutrition-sensitive agriculture, coupled with nutrition-specific interventions for nutritional advisory services for food-insecure households and particularly vulnerable population groups such as women and young children. The knowledge transfer is aimed at putting households in a better position to secure adequate nutrition for the members of the households based on their resources. Lessons learned from the implementation of the multisectoral approach will be processed and fed into the national political processes and programmes.
The focus of the Ethiopian country package including a Nutrition Sensitive Agriculture Programme (NSAP) is on three areas of intervention:

(1) Rural households in the selected woredas of the Tigray Region have increased their availability of diverse foods
(2) Rural households and intermediaries in the selected woredas of the Tigray Region have improved their knowledge (esp. preparation and processing) with regard to healthy eating and hygiene and care practices
(3) Multisectoral coordinating bodies at national, regional, woreda and village level are technically and organisationally strengthened.

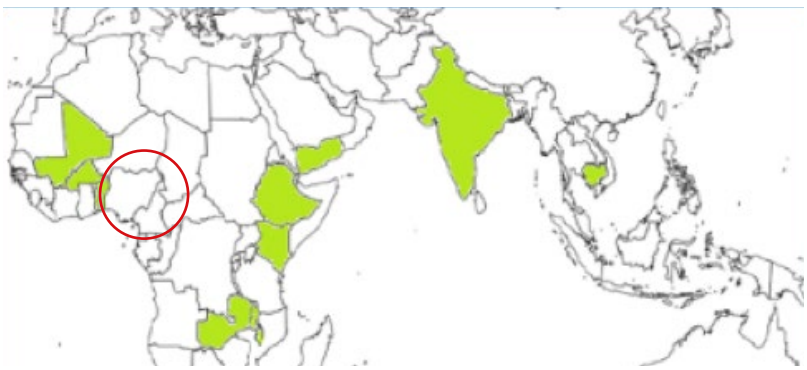

Figure 2: Overview of countries for the nutrition baseline surveys (NBS) (adapted after www.wmap.org)

Several non-governmental organizations (NGO) such as CONCERN, the World Food Program, World Vision, Mums for Mums or the Orthodoxian Church are addressing food security and malnutrition in the overall Tigray Region, but also woreda specific. Efforts aim at the structural reduction of hunger and malnutrition, especially in mothers and young children. An overview on organizations and interventions is presented in (Annex A, page 52). The GIZ 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 (Figure 3) that describes the 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 influence malnutrition – as identified by the model:

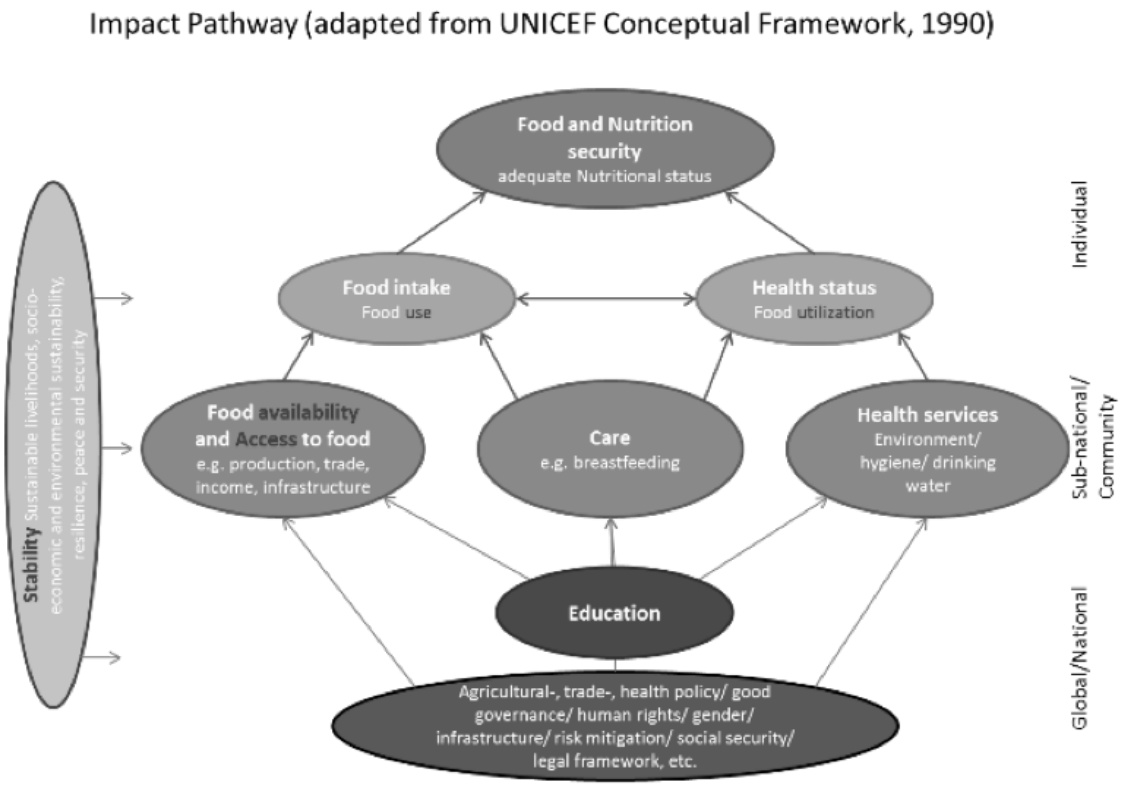

Figure 3: UNICEF Model

- 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 (623 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 up-coming generations.

The main indicators of the NBS Ethiopia are:
Individual Dietary Diversity Score Women (IDDS-W) for mothers 15-49 years of age
Minimum Acceptable Diet (MAD) for infants and young children 6-23 months of age
Household Food Insecurity Experience Scale (HFIES) of interviewed households
Crop diversity and post-harvest handling of interviewed households

3. METHODS

3.1. Project Area, Participants and Sample Size

The project area consists of the three selected woredas of the Tigray Region, Kola Tembien, Laelay Adiabo, and Ganta Afeshum (Figure 4).

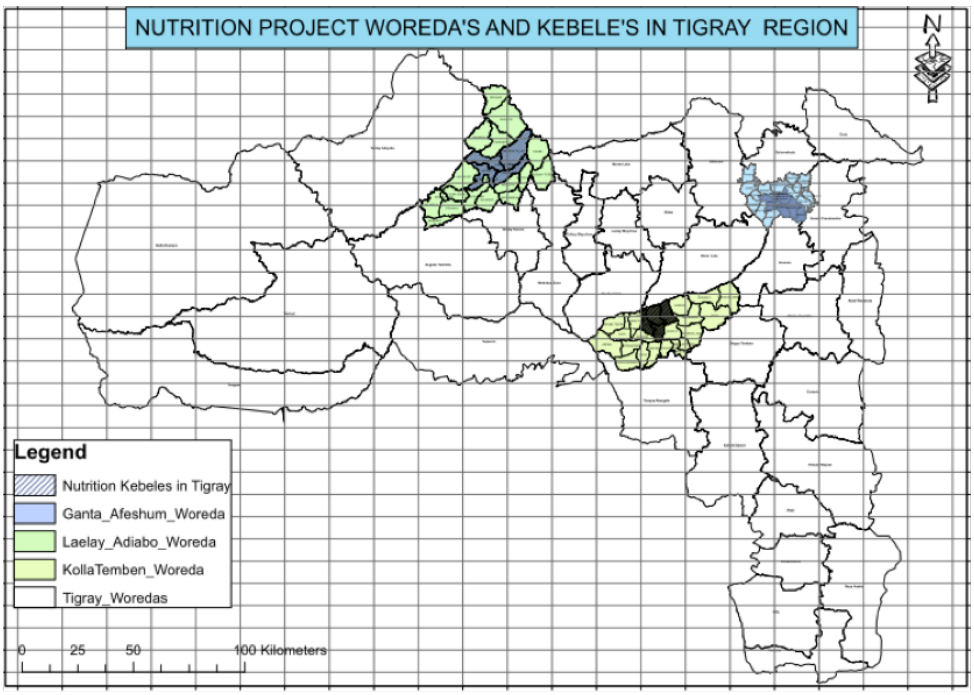

Figure 4: Map of project area (GIZ 2015)

The Tigray Region has one of the highest stunting rates in Ethiopia with 47% of children under the age of five years being affected by chronic malnutrition. Almost all belong to the ethnic group Tigray (97%) and to the Orthodox Christian Church (96%)(10). The region is divided into seven zones which encompass 35 rural woredas (districts) and some urban districts. Kola Tembien is located in the Central Tigray Zone, Laelay Adiabo in the North West Tigray Zone, and Ganta Afeshum in the East Tigray Zone. Demographic

and agricultural information of the three selected woredas are presented in Table 1.

Table 1: Characteristics of three selected woredas[11,10]

	Kola Tembien	Laelay Adiabo	Ganta Afeshum
Total population	149,346	127,800	99,112
Area [km²]	2,538	2,809	1,636
Population density [persons/km²]	58.8	45.5	60.6
Persons/household	8.9	4.5	4.6
Orthodox [%]	99.9	97.8	99.1
Average land size/farmer [ha]	0.81	1.16	0.37
Usage [%]			
Under cultivation	85	89.4	83.4
Pasture	0.9	1.3	2.7
Fallow	10.8	7.5	5.2
Woodland	0.2	0.02	2.0
Other	2.8	1.8	6.9
Under cultivation [%]			
Cereals	78	85.2	64
Pulses	4.6	1.9	8.9
Oilseeds	1.8	1.7	0.6
Vegetables [% or ha]	0.1	0.4	13 ha
Fruit trees [% or ha]	0	6 ha	646 ha

Participants and Sample Size

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

- Women of reproductive age (15-49 years)
- Infants and young children between 6-23 months

The calculation of the sample size, i.e. households with eligible participants, was based on an increase of 0.5 food groups in women as a target impact of the overall programme. An increase of 0.5 food groups is equal to a 5% increase in consumed food groups since dietary diversity of women is measured based on 10 food groups. The calculation of the necessary sample size was done with GPower[12]. A sample size of 347 was calculated and added by 13% drop-out. Calculation was done for one-sided test. The calculated sample size does not change regardless of the baseline mean food group score (Table 2).

Table 2: Sample size calculation for SEWOH NBS

Mean Baseline	Mean Endline	α error	Power 1-β error	SD	N Baseline	N End-line	Overall
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 woredas were the primary sampling unit. Population information of these woredas including all villages was provided by the GIZ Senior Monitoring and Evaluation Manager. The calculated 400 households to be selected were proportionally distributed among the woredas based on the provided population information. It was estimated to conduct up to 40 interviews per day. In addition to the total population on woreda level, population on village level was estimated based on provided information. **At the first sampling stage**, villages served as clusters and were randomly selected according to probability sampling proportional to size (Table 3). The number of villages to be selected based on a calculation of the least number of infants and children between the age of 6-23 months to be expected in the clusters. The least number of children 6-23 months of age to be expected per cluster (village) was 24 (1.6%). Thus, a total of 17 villages had to be selected. In case there were not enough children found in a cluster, additional children were sampled from the neighbouring village. The random sampling process of clusters followed the "Guidelines for nutrition baseline surveys in communities" (Gross et al 1997).

Table 3: Population information and estimations for NBS

Woreda	Overall population	Population [%]	Number of households to be selected	Least number of expected eligible children per village	Number of selected clusters	Planned survey days*	Actual survey days*
Kola Tembien	26204	29	118	24	5	3	3
Laelay Adiyabo	29864	34	134	24	6	4	4
Ganta Afeshum	32802	37	148	24	6	5	5
Overall	**88870**	**100**	**400**	**Ø 24**	**17**	**12**	**12**

* Excluding travel days

The overall number of inhabitants in the study area was divided by the calculated number of clusters which then served as the mean number of inhabitants. Afterwards, a number below this mean was generated using an online random number generator. With this random number, a series of numbers (equivalent to the number of clusters to be selected) was constructed by addition of the mean number of inhabitants to this random number and subsequently to each sum (Annex B, p. 54). Using cumulative population information for the study area, 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. Due to logistic constraints and dangerous pathways to reach the households encountered during the data collection, two selected villages were replaced. Chemrero was replace by Merere and Mekodie was replaced by Dkonioa.

At the second sampling stage, between 22 and 25 households per cluster were randomly selected. Main selection criteria for households were at least one woman in reproductive age (15-49 years) and at least one child in the age group 6-23 months.
Ideally, to select households, a number (1-6) was generated for each cluster using a random number generator. Starting from the centre of the village, the enumerator teams counted households until the generated number was reached. Up to four teams worked in one cluster. Each enumerator team went into a different direction. If the identified household did not have a woman in the reproductive age as well as a child 6-23 months of age, the enumerator team went to the next household. After finishing an interview, the enumerator team started counting the households starting with one until the generated number was

reached. 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, always the youngest child was enrolled. The same approach was used for twins.
Due to the scattered distribution of households and walking distance of up to one hour to reach the next household, the explained approach was not always possible. In all villages, village volunteers supported enumerator teams to find eligible households.
Prior to data collection, each district agent was informed about the survey and helped to identify the village volunteers. After arriving in the village or already at the woreda centre, the team introduced itself, explained the random selection of households, and asked for permission to collect data.

3.3. Data collection

The data collection took place between 18th January and 5th February 2016. Prior to data collection, 20 enumerators (ten males and ten females) were trained for five days (Annex C, p. 55). Two enumerators were selected to work as supervisors and the remaining eighteen enumerators were selected to conduct the interviews. Each team consisted of at least one female enumerator. 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 on the tablet. Each survey day, a total of eight teams went into the field. One team stayed at the base on a rotation basis. Each supervisor was responsible for four teams on each day of the data collection. However, teams may have varied between days. Every survey day, two to four villages were visited and each enumerator pair conducted up to five interviews per day. All interviews were conducted in the local language Tigrinya. Enumerator 1 had a paper-based version in Tigrinya, whereas the tablet version was in English. 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 (Figure 5, p. 9). After the interview, enumerators 1 and 2 compared the paper based and tablet version of the 24h dietary recalls to minimize recording bias. Furthermore, GPS coordinates of the household were recorded which usually only took a few seconds.

Figure 5: Interview settings and recording of GPS signal

Interviews were conducted according to the *Nutrition Baseline Survey Interview Guide* (Annex D, p. 57) 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 by the assigned supervisors using the *Quality Control Protocol for Interviewer* (Annex E, p. 59). Tablets were recharged every evening at the respective base (Figure 6, p.10).

Figure 6: Charging station after each survey date

3.4. Indicators and design of the questionnaire

Data were collected with a standardized questionnaire, which is used in all SEWOH countries, but adapted to each specific country setting and programme. Information of the applied assessment instruments are presented in following and in summary in Table 4. The questionnaire is presented in Annex J, p. 61.

Table 4: Overview of collected information and assessment instruments

	Collected data	Assessment instrument
1	Socio-demographic information	Structured questions
2	Agriculture	Structured questions
	Access to crops, vegetable, fruits	Structured questions
	Storage and processing	Structured questions
	Access to animals, use of eggs	Structured questions
3	Sanitation and hygiene situation	Structured questions
	Access to unclean water and treatment	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)
11	Appearance of household	General observation by survey team

Household Food Insecurity Experience Scale (HFIES)

The Household food insecurity experience scale (HFIES) was used to examine the existence and severity of food insecurity of households. The HFIES is composed of eight questions with dichotomous yes/no responses and two extended follow-up questions. 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 survey population. 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 8 (if 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 7-8 (if 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[13].

Questions	The household is……	
1	Worried not to have enough food	
2	Unable to eat healthy and nutritious food	
3	Ate only a few kinds of food	
4	Skipped a meal	
5	Ate less than should eat	
6	Ran out of food	
7	Were hungry but did not eat	
8	Went without food for a whole day	
	Score	0-8

Dietary diversity of Women

Dietary diversity of women was assessed and categorized with the indicators "Individual Dietary Diversity Score" (IDDS-W) and "Minimum Dietary Diversity" (MDD-W). 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 was collected by conducting **free qualitative 24h-recalls**, whereby respondents are asked to recall all food items they consumed during the day and night prior to the interview. The different consumed food items are assigned to predefined food groups (Table 5, p. 12) and used to calculate IDDS-W and MDD-W. Individual Dietary Diversity Score was assessed based on a **ten food group scale**(14). To calculate the prevalence of Minimum Dietary Diversity–Women (MDD-W), FAO recommends a cut-off point **of five 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(14).

Table 5: Food groups of the ten food group scale with respective Ethiopian food items consumed in the Tigray Region

1	**Starchy staple foods**	Foods made from teff (red and white), wheat, barley, maize, sorghum, finger millet (injera, porridge, bread (kita), besso), spaghetti, pasta, rice, oats, cornflakes, white or Irish potatoes
2	**Beans and peas**	Any foods made from mature beans or peas (fresh or dried) (cowpeas, fava beans, chickpeas, field peas, grass peas, lentils
3	**Nuts and seeds**	Any foods made from groundnuts, peanut butter, pumpkin seeds, sunflower seeds, noug seeds, safflower seeds, sesame, flax or any other nuts or seeds
4	**Dairy products**	Milk (fresh or powder), cheese, yoghurt or other milk products
5	**Flesh foods**	Any kind of meat, organ meat, sea food
6	**Eggs**	Eggs from any kind of birds
7	**Dark green leafy vegetables**	Any dark green leafy vegetables including wild green vegetables like Swiss chard, cassava leaves, amaranth, bean leaves, pumpkin leaves, rape, mustard,
8	**Vitamin A-rich fruit/ vegetables**	Ripe mangoes, ripe papayas, pumpkin, carrots, squash, or orange fleshed sweet potatoes
9	**Other vegetables**	Any other vegetables like cabbage, eggplants, tomatoes, onions, green pepper, cucumber, lettuce, beet root
10	**Other fruits**	Any other fruit like oranges, lemons, tangerines, bananas, avocado, guava, apple, watermelon, grapes, strawberries, beles (cactus fig), other fruits

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

Minimum acceptable diet (MAD) of children 6-23 months of age was assessed to evaluate the nutritional intake of the children. To assess the nutrition intake of children, the primary care taker, usually the mother, was asked to recall all foods and drinks the children consumed the previous day and night with the use

of a free qualitative 24h dietary. The WHO indicator MAD and its required indicators 1. Minimum Dietary Diversity (MDD) and 2. Minimum Meal Frequency (MMF) were assessed and analysed according to WHO guidelines[15].

1. MDD - 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, p. 13).
Definition: Proportion of children 6–23 months of age who receive foods from 4 or more food groups.

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

2. MMF -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 age 6-8 months and 3 times or more daily for children age 9-23 months. For non-breastfeeding children age 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.

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

and

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

The MAD (minimum acceptable diet) for breastfed children age 6-23 months **is defined as receiving the MDD - minimum dietary diversity and the MMF - minimum meal frequency**, while it for non-breastfed children 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).

$$\frac{\textit{Breastfed children 6–23 months of age who had at least the minimum dietary diversity and the minimum meal frequency during the previous day}}{\textit{Breastfed children 6–23 months of age}}$$

and

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

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

1	**Grains, roots and tubers**	Foods made from teff (red and white), wheat, barley, maize, sorghum, finger millet (injera, porridge, bread (kita), besso), spaghetti, pasta, rice, oats, cornflakes, white or Irish potatoes
2	**Legumes and nuts**	Any foods made from mature beans or peas (fresh or dried) (cowpeas, fava beans, chickpeas, field peas, grass peas, lentils; Any foods made from groundnuts, peanut butter, pumpkin seeds, sunflower seeds, noug seeds, safflower seeds, sesame, flax or any other nuts or seeds
3	**Dairy products**	Milk (fresh or powder), cheese, yoghurt or other milk products (ice cream)
4	**Flesh foods**	Any kind of meat, organ meat, sea food
5	**Eggs**	Eggs from any kind of birds
6	**Vitamin-A rich fruit/ vegetables**	Any dark green leafy vegetables including wild green vegetables like Swiss chard, cassava leaves, amaranth, bean leaves, pumpkin leaves, rape, mustard, ripe mangoes, ripe papayas, pumpkin, carrots, squash, or orange fleshed sweet potatoes
7	**Other fruits/ vegetables**	Any other vegetables like cabbage, eggplants, tomatoes, onions, green pepper, cucumber, lettuce, beet root; Any other fruit like oranges, lemons, tangerines, bananas, avocado, guava, apple, watermelon, grapes, strawberries, beles (cactus fig), other fruits

Knowledge, attitudes, and practices

Nutrition-related knowledge, attitudes and practices (KAP) questions are a useful method to gain insight into peoples' personal determinants of their dietary habits and closely related hygiene and health issues. 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[16]. Several KAP questions which were related to the aims of the NBS were included into the questionnaire

Nutritional knowledge/behaviour of women:
Please tell me some ways to make porridge more nutritious or better for your baby's health
(Max. score 5)
How can you recognize that someone is not having enough food? Probe if necessary: What are the signs of undernutrition? (Max. score 4)
What are the reasons why people are malnourished? (Max. score 3)
What should we do to prevent malnutrition among young children (6–23 months)? (Max. Score 5)
When (name of child) is sick, which includes having diarrhea, is he/she given less than usual, about the same amount, more than usual or nothing to drink (including breast milk)?
When (name of child) is sick, which includes having diarrhea, is he/she given less than usual, about the same amount, more than usual or nothing to eat?

Hygiene behaviour
Could you describe how you store water in your household?
What do you usually do to the water to make it safer to drink?

- When you used soap yesterday or today, what did you use it for? (If washing for hands was named, asked what was the occasion)
- Please describe step by step how you wash your hands

- Food poisoning often results from contact with germs from faeces. What can you do to avoid sickness from germs from human or animal faeces? (Max. Score 5)

Additional questions on request by the project

- What kind of vegetables do you grow or are accessible to you (rent and share)?
- What is the main use of vegetable produce?
- Do you store your grown vegetable?
- Do you face any problems with storage of grown vegetables?
- Do you process any of your grown vegetable?
- Do you experience any major post-harvest losses on vegetable crops?
- What kind of fruit or fruit trees do you grow or are accessible/are shared with you?
- Do you use any fertilizer, herbicides, or pesticides?
- How often do you (the mother) consume eggs? (when it is no fasting season)
- Do you conduct fasting?
- How far do you have to go to get your drinking water? Round-way
- Do you have any access to unclean water nearby your house?
- Do you wash your hands after defecation?
- What did you give your child right after giving birth?
- Did you fast yesterday or was your food intake different from usual yesterday?

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 23.0. 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±SD and frequencies. Minimum and maximum are additionally presented in the Annex K.

4. RESULTS

A total of 400 households were included in the data collection, 118 in Kola Tembien, 134 in Laelay Adiabo, and 148 in Ganta Afeshum. Two data sets from Laelay Adiabo had to be excluded due to wrong age of respondent or child. The comprehensive results disaggregated by woredas are also presented in Annex K, p. 72). 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. Figure 7 shows the location of the selected households.

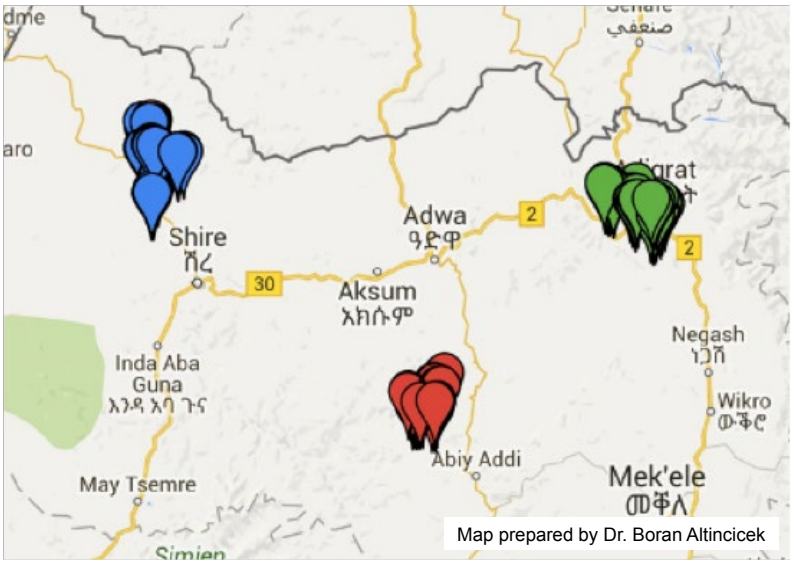

Figure 7: Survey area with GPS spots of visited households (Kola Tembien (red), Laelay Adiabo (blue, Ganta Afeshum (green))[1]

1 Prepared with google maps: https://www.google.com/maps/d/edit?mid=z6_PvGRNP3do.k4wNbemVxbLk

4.1. Socio demographic information

Mean age of mothers was 28.7±6.5 years and of children was 13.2±5 months. The majority was married and belonged to the Orthodox Christian Religion. The mean number of household members was 5.6±1.9, over 80% were male-headed with the lowest rate in Kola Tembien. Less than 50% of respondents were able to read and write and had some form of formal education. Fifty-five percent stated to not have any kind of school education. The highest literacy and education rates and years were found in Ganta Afeshum. Table 7, p. 8, presents detailed information on the socio demographic data of respondents.

Table 7: Socio demographic data of respondents overall and by WOREDA/district

	Overall (n=398)	Kola Tembien (n=118)	Lalaey Adiabo (n=132)	Ganta Afeshum (n=148)
Age of respondents, years [mean±SD]	28.7±6.7	27.7±6.5	27.6±5.9	30.5±7.2
Age of children, months [mean±SD]	13.2±5.1	12.2±4.7	13.4±5.4	13.8±5.0
Members/household [mean±SD]	5.6±1.9	5.3±1.9	5.6±1.9	5.9±1.9
Marital status [%]				
Married	91.5	92.4	91.7	90.5
Widowed	0.3	0.8	0	0
Divorced or separated	7.0	5.1	8.3	7.4
Single	1.3	1.7	0	2.0
Orthodox Christian [%]	99.5	99.2	99.2	100
Male headed household [%]	81.4	73.7	84.8	84.5
Literacy rate [%]	43.7	42.4	32.6	54.7
Education rate* [%]	44.5	43.2	34.1	56.1
Years in education (n=176) [mean±SD]	5.8±2.8	5.9±2.9	5.0±2.7	6.2±2.8

*Percentage of women who had some form of formal education

Respondents were asked for income sources of their household throughout the year. Table 8 presents the different income sources. The main income sources sale of crops (57.5%) sale of animals/animal products (56.5%), temporary salary (45.2), but also public transfer such as cash for food or work (38.7%). For the latter one, a high percentage of respondents relied on public transfers in Ganta Afeshum. Overall, mean income score as a sum of all income sources, was 2.4±1.0 and was similar in all three woredas. Only a small percentage (2.3%) of respondents relied on subsistence farming only (excluding public transfer and remittance of relatives).

Table 8: Sources of income

Source of income [%]	Overall (n=398)	Kola Tembien (n=118)	Lalaey Adiabo (n=132)	Ganta Afeshum (n=148)
Sale of crops	57.5	44.9	72.7	54.1
Sale of animal products	56.5	58.5	49.2	61.5
Sale of goods/crafts	6.0	9.3	6.1	3.4
Temporary salary	45.2	65.3	41.7	32.4
Petty trade/small business	14.8	22.9	11.4	11.5

Regular salary	5.0	2.5	4.5	7.4
Remittance from relatives/husband	9.5	7.6	8.3	12.2
Public transfer (cash for work/food)	38.7	29.7	10.6	70.9
Renting farm land	4.8	5.9	5.3	3.4
Mining	4.5	0.8	12.9	0
Income score [mean±SD]	2.4±1.0	2.5±1.1	2.2±1.0	2.6±0.9
Subsistence farming only	2.3	3.4	3.0	0.7

4.2. Agriculture

In regard to agricultural resources, questions were asked concerning production of grains, vegetables, fruits, but also of livestock. In addition, storage and processing of vegetables were assessed. A total of 94.7% of respondents had access to land (Kola Tembien 94.1%, Laelay Adiabo 97.0%, Ganta Afeshum 93.2%), where they mostly grew grains. Cultivated crops differed between woredas with maize and teff dominating in Kola Tembien and Laelay Adiabo, sorghum in Kola Tembien, and barley in Ganta Afeshum. Finger millet was also one major crop in Laelay Adiabo. Legumes were mainly cultivated in Kola Tembien and Ganta Afeshum. A detailed list of cultivated crops is presented in Table 9. The land for the food crops are very rocky (Figure 8, p. 19) and are ploughed with the help of cattle and donkeys. Participants reported that rain season was short this season. Kola Tembien seemed to be most affected by drought, followed by Laelay Adiabo and Ganta Afeshum.

Table 9: Types of cultivated grains, legumes and oil seeds, and mean crop diversity

Crops [%]	Overall (n=377)	Kola Tembien (n=111)	Lalaey Adiabo (n=128)	Ganta Afeshum (n=138)
Maize	69.8	90.1	89.1	35.5
Teff	60.5	83.8	92.2	12.3
Wheat	38.2	7.2	0.8	97.8
Barley	49.9	55.9	7.0	84.8
Haflet	9.3	2.7	0.8	22.5
Sorghum	36.6	83.8	23.4	10.9
Finger millet	40.6	31.5	83.6	8.0
Irish potato	4.5	0.9	3.1	8.7
Orange FS potato	0.3	0	0	0.7
Legumes	42.7	58.6	20.3	50.7
Fenugreek	10.6	11.7	1.6	18.1
Sunflower	4.8	12.6	2.3	0.7
Safflower	1.1	1.8	0.8	0.7
Sesame	6.4	15.3	3.9	1.4
Noug	9.8	27.0	5.5	0
Flax	6.0	11.9	2.3	4.7
Crop diversity score [mean±SD]	3.9±1.9	4.9±2.2	3.4±1.2	3.6±1.7

Figure 8: Agricultural land (fallow)

Around 70% of the respondents reported to have a home garden and around 60% of those owners were growing vegetables in their home gardens. Around 30% also grew vegetables outside of a home garden. In total, 206 households were growing vegetables either in a home garden or on some land outside a home garden (Figure 9, p. 21). This equals to 52% of overall respondents. In the overall study area, most cultivated vegetables were tomatoes and green pepper. However, type of vegetables differed between woredas and are presented in Table 10, p. 20. Diversity seemed to be highest in Ganta Afeshum, with also the highest access to irrigated land.

About ¼ of respondents had access to fruits or fruit trees with the higher percentage in Ganta Afeshum. Here, beles (cactus fig) is very common. However, this fruit is not available throughout the year. In the other woredas, mango, guava, and citrus trees were more common. In all three woredas, existence of wild fruit trees was observed. Utilization of such wild fruit trees might be evaluated for future project and improvement of access to fruits (Figure 10, p. 21). Livestock keeping was very common in all three woredas, with over 90% of households keeping either shoat, cattle, or chicken, or a combination of these (Figure 11, p. 22). Table 11, p. 21, presents how often mothers consumed eggs and whether they would conduct fasting.

Table 10: Home garden and livestock ownership

	Overall	Kola Tembien	Lalaey Adiabo	Ganta Afeshum
Households (n=398) with home garden, [%]	69.6	73.7	74.2	62.2
Households with home gardens (n=277) grows vegetables, [%]	61.4 (n=170)	64.4 (n=56)	74.5 (n=73)	44.6 (n=41)
Yes, during rainy season	90.0	94.6	93.2	78.1
Yes, during dry season	0.6	0	0	2.4
Yes, year around	9.4	5.4	6.8	19.5
Household grows vegetables **outside home garden (n=398),** [%]	29.9 (n=119)	25.4 (n=30)	31 (n=41)	32.4 (n=48)
Yes, on irrigated land	52.1	43.3	22.0	83.3
Yes, on rain-fed land	47.9	56.7	78.0	16.7
Types of vegetables grown by households [%]	N=206	N=62	N=82	N=63
Tomatoes	66.0	70.5	62.2	66.7
Onions	38.3	19.7	34.1	61.9
Carrots	4.9	6.6	2.4	6.3
Lettuce/Swiss chard	30.6	44.3	12.2	39.7
Cabbage	14.6	4.9	2.4	39.7
Green pepper	75.4	76.2	92.3	52.4
Beet root	4.4	1.6	4.9	6.3
Garlic	28.2	19.7	29.3	34.9
Pumpkin	0.3	0	0.8	0
Vegetable diversity score, mean±SD	2.6±1.6	2.4±1.5	2.4±1.5	3.1±1.8
Households with access to fruits (n=398), [%]	26.4	18.6	14.4	43.2
Type of fruits grown by households [%]	N=105	N=22	N=19	N=64
Mango	19.0	68.5	21.1	1.6
Citrus	18.1	36.4	47.4	3.1
Guava	20.0	4.5	47.4	17.2
Papaya	9.5	27.3	21.1	0
Banana	4.8	13.5	5.3	1.6
Avocado	5.7	9.1	5.3	4.7
Beles (cactus fig)	56.2	4.5	0	90.6
Apple	2.9	0	0	4.7
Peach	1.0	0	4.8	0
Fruit diversity score, mean±SD	1.4±0.8	1.6±0.9	1.5±0.8	1.2±0.6
Households keeping livestock (N=398) [%]	94.2	94.9	94.7	93.2
Type of animal kept [%]	N=375	N=112	N=125	N=138
Shoat	65.2	68.8	45.6	79.9
Cattle	84.8	89.3	83.2	82.7
Poultry	84.8	87.5	89.6	78.4

Table 11: Egg consumption and fasting

Egg consumption, fasting [%]	Overall (n=398)	Kola Tembien (n=118)	Lalaey Adiabo (n=132)	Ganta Afeshum (n=148)
I do not eat any eggs	12.6	11.0	12.1	14.2
I eat eggs every other day	8.3	6.8	6.8	10.8
I eat eggs at least once per week	46.5	53.4	49.2	38.5
I eat eggs less than once per week	32.7	28.8	31.8	36.5
I conduct no fasting	0.5	1.7	0.0	0.0
I sometimes conduct fasting	13.1	11.0	12.2	15.5
I fast every time	86.4	87.3	87.9	84.5

Figure 9: Vegetable gardens of respondents or village inhabitants

Figure 10: Wild fruit trees

Figure 11: Animal keeping

4.3. Usage of vegetables, fruits, and livestock

Respondents were asked for the usage of their grown vegetables, fruits, and kept livestock. Figure 12 presents main of products in the overall study area. Vegetables are mainly produced for own consumption, followed by fruits, and livestock keeping. However, around 20% of households mainly use it for sale. Figure 13-15, p.22-23, present usage of the commodities in regard to the three woredas. Own consumption of their products in addition to sale may be promoted in future nutrition and agriculture education programmes, tailored to the specific commodity.

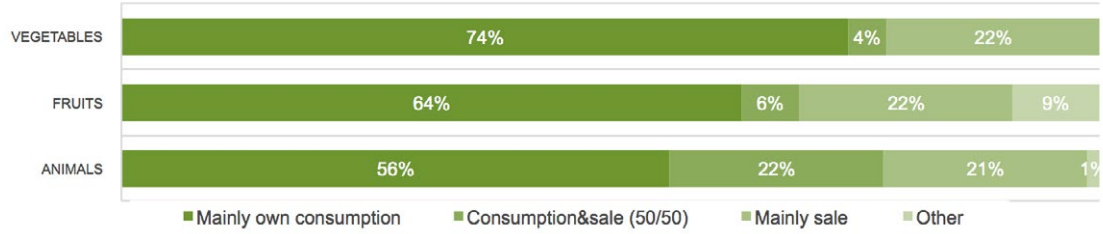

Figure 12: Main use of products

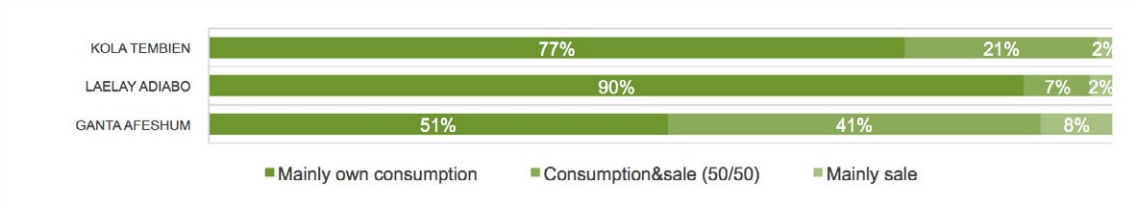

Figure 13: Main use of vegetables according to woreda

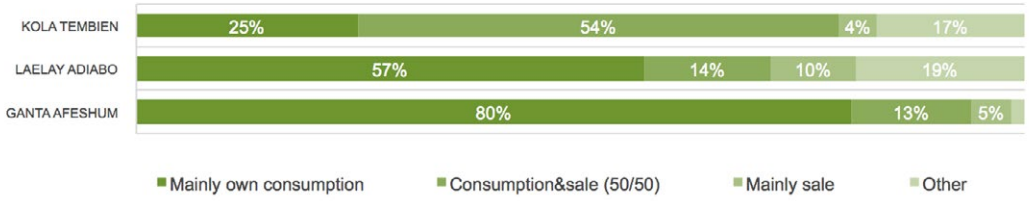

Figure 14: Main use of fruits according to woreda

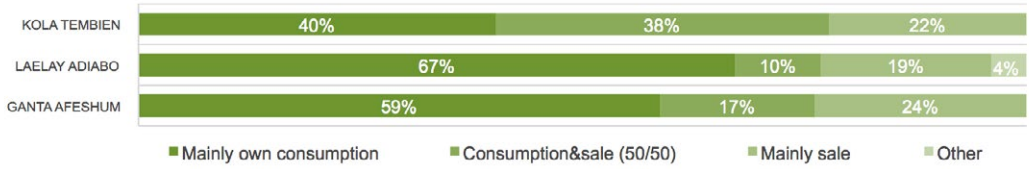

Figure 15: Main use of livestock/animal products according to woreda

4.4. Storage and processing of vegetables

Only a small percentage of all respondents stored vegetables, i.e. 11.2% (n=23) (Kola Tembien 14.8%, Laelay Adiabo 8.5%, Ganta Afeshum 11.1%). Of these, 6 respondents stated to face storage problems due to humidity (n=3), space (n=2), and insects (n=1).
Around **12% (n=25) stated to process their vegetables after harvesting**, with all naming drying as the choice of processing. Sixteen percent (n=33) reported post-harvest losses. Main affected crops were green pepper and tomatoes. Ten respondents applied crop spacing to reduce post-harvest losses, whereas 6 respondents applied chemicals. Detailed information can be found in the appendix.

Almost all respondents (**97.9%) applied some fertilizer, herbicide, or pesticide** to their crop production. Table 12 presents the different kind of substance used. Most of them mixed compost with some chemical fertilizer. The use of chemicals should be investigated further. Also, integrated pest management techniques should be addressed in the area.

Table 12: Usage of fertilizer, pesticides, and herbicides

Type [%]	Overall (n=369)	Kola Tembien (n=114)	Lalaey Adiabo (n=109)	Ganta Afeshum (n=142)
Urea	94.9	99.1	87.1	98.5
DAP	97.3	93.6	97.6	100
Compost	78.5	90.8	61.0	84.6
Round-up	21.5	31.2	25.2	10.3
2-4,d	40.4	60.6	56.5	9.6

4.5. Household food insecurity

Respondents were asked if they participated in any social- and/or food-security programmes. Access to agricultural development programmes was mentioned mostly around 55% participated in such programmes. Households in Ganta Afeshum had the highest participation in such programmes, followed by Kola Tembien and then Laelay Adiabo (Table 13).

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

Social / food-security programme [%]	Overall (n=398)	Kola Tembien (n=118)	Lalaey Adiabo (n=132)	Ganta Afeshum (n=148)
School feeding	3	0	6.8	2.0
Agriculture Development	55	54.2	45.5	64.2
Social cash transfer	42	36.4	13.6	71.6
Food Aid	20.6	17.8	14.4	28.4

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 32.2% of respondents were categorised as food secure and most respondents (48.7%) were categorized as mildly food insecure. In 2015, the harvest was very low due to limited rainfall. The higher proportion of food secure households was found in Ganta Afeshum. Table 15 presents the categories or questions in regard to the HFIES which were responded with yes by respondents. The most mentioned category was being worried not to have enough food and to be unable to eat healthy and nutritious food.

Table 14: Household Food Insecurity Experience Scale (HFIES)

Classification of food security [%]	Overall (n=398)	Kola Tembien (n=118)	Lalaey Adiabo (n=132)	Ganta Afeshum (n=148)
Food secure (Score 0)	32.2	26.3	33.3	35.8
Mildly food insecure (Score 1-3)	48.7	46.6	56.1	43.9
Moderately food insecure (Score 4-6)	17.8	24.6	10.6	18.9
Severely food insecure (Score 7-8)	1.3	2.5	0.0	1.4

Table 15: Questions/categories of the HFIES

	Question/Category [%]	Overall (n=398)	Kola Tembien (n=118)	Laelay Adiabo (n=132)	Ganta Afeshum (n=148)
1	Worried not to have enough food	55.8	60.2	53.3	54.1
2	Unable to eat healthy and nutritious food	37.4	41.5	34.8	36.5
3	Ate only a few kinds of food	36.2	40.7	26.5	41.2
4	Skipped a meal	13.8	18.6	6.1	16.9
5	Ate less than should eat	21.1	34.7	13.6	16.9
6	Ran out of food	1.0	0.8	0.8	1.4
7	Were hungry but did not eat	5.8	11.9	2.3	4.1
8	Went without food for a whole day	0.8	1.7	0.8	0.0

4.4. Storage and processing of vegetables

Drinking water from an improved source was defined as water coming from piped water into dwelling, yard or plot, public tab 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 dry season, improved drinking water was accessible for 81.9% and 82.2% of the surveyed households (Kola Tembien: 94.1%, 94.9%; Laelay Adiabo: 89.4%, 84.9%; Ganta Afeshum: 65.5%, 69.6%%, respectively). Here, Ganta Afeshum had the lowest access to improved drinking water and during field observations, several broken water stand pipes were seen. Most drinking sources were public stand pipes (Figure 16). Further, respondents were asked how far they had to go (round-way) to fetch drinking water. Figure 17, p. 26, presents the reported distance in time to cover to fetch drinking water with the highest percentage of a long distance in Ganta Afeshum. Water was either collected with the help of donkeys or persons would carry the containers (Figure 18, p. 26).

Figure 16: Public water stand pipe

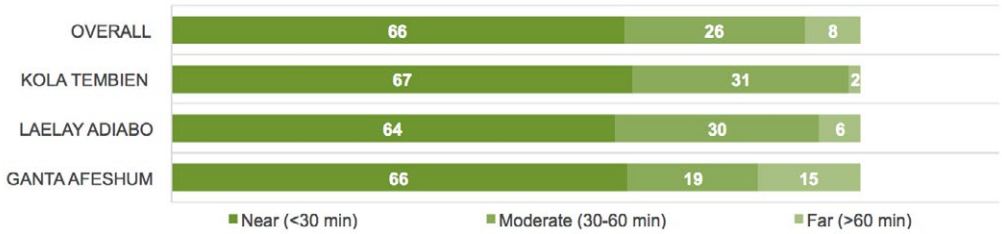

Figure 17: Distance to drinking water [%]

Figure 18: Transportation of drinking water

Respondents were asked to freely recall how they stored water. The answers were assigned to three predefined categories (plus “others”) presented in Table 16. 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. Around ¾ of respondents stored their water in the most improved way (Figure 19, p. 27).

Table 16: Storage of water

Way to store water [%]	Overall (n=398)	Kola Tembien (n=118)	Lalaey Adiabo (n=132)	Ganta Afeshum (n=148)
Clean container/jar	15.8	13.6	15.9	17.6
Covered container/jar	9.0	6.8	11.4	8.8
Clean and covered container/jar	74.9	79.7	72.0	73.6

Figure 19 Storage containers for drinking water

Respondents were further asked, if they were treating their water to make it safer to drink. Only **16.4% (of 398 respondent) treated their drinking water to make it safer to drink** (Kola Tembien 15.3%, Laelay Adiabo 12.9%, Ganta Afeshum 19.6%). However, most household had access to improved sources of drinking water. Table 17, shows freely recalled descriptions of respondents explaining how they usually treated drinking water to make it safer to drink.

Table 17: Mentioned treatment ways of water for safe consumption (n=64)

Treatment of drinking water [%]	Overall (n=64)	Kola Tembien (n=18)	Lalaey Adiabo (n=17)	Ganta Afeshum (n=29)
Boil it	26.6	22.2	5.9	41.4
Strain it through a cloth	56.3	50.0	64.7	55.2
Use a filter	4.7	11.1	5.9	0.0
Use solar disinfection	4.7	0.0	11.8	3.4
Let it stand and settle	7.8	16.7	11.8	0.0

In addition, respondents were asked how they would rate the quality of their drinking water. Here, the majority (90.7%) rated their water as good quality (Kola Tembien 96.6%, Laelay Adiabo 89.4%, Ganta Afeshum 87.2%). However, in Laelay Adiabo, inhabitants reported water sources which were not safe to drink and to cause parasite infections among the village inhabitants.

To explore possibilities to apply water filters in future projects, repondents were asked whether they **had access to any dirt water** (Figure 20, p. 28). Overall 31.9% reported to have access to dirt water with the highest availability in Laelay Adiabo (43.2%) followed by Kola Tembien (28.0%) and Ganta Afeshum (25%).

Figure 20: Dirt water which is currently only used for cattle

The majority of households were using an unimproved **sanitation** facility (87.7%), 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 facilities[2], which might be a reason why usage of improved sanitation facilities was quite low. Open defecation was reported by 51.5% of respondents (Kola Tembien 46.6%, Laelay Adiabo 71.2%, Ganta Afeshum 37.8%). Access to improved sanitation was best in Ganta Afeshum with 20.9%, followed by Kola Tembien with 11.9% and Laelay Adiabo with 3.0%. Figure 21 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 9.8% had improved drinking water and improved sanitation facilities. An example of an improved sanitation facility is presented in Figure 22, p. 29.

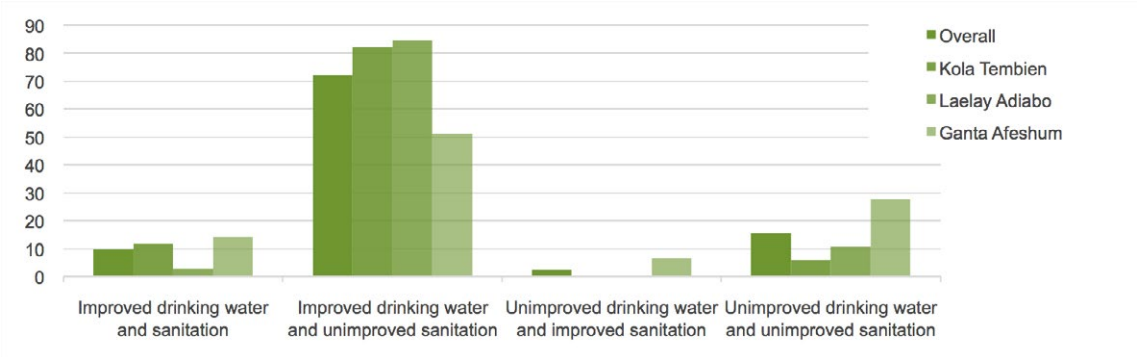

Figure 21 Access to improved/unimproved drinking water and sanitation facility

2 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.

Figure 22 Improved toilet facility with slab, ventilation and hand washing stand

Respondents were also directly asked whether they washed their hands after defecation. Overall, **65.6% stated to wash their hands after defecation with soap** (Kola Tembien 67.8%, Laelay Adiabo 65.9%, Ganta Afeshum 64.5%), whereas almost all remaining respondents stated to wash their hands, but without soap. Only 1% stated not to wash their hands after defecation.

At the time of the survey, **soap was available in 88.4% of the households** (Kola Tembien 84.7%, Laelay Adiabo 92.4%, Ganta Afeshum 87.8%). The last time the respondent used soap was mainly for personal hygiene (taking bath) and cleaning homes and dishes (75.4%). If respondents mentioned to use soap for washing hands, the enumerators had to probe for the occasion[3] . Less respondents stated to use soap after defecation in this indirect inquiry as compared to the direct question above. Overall, the hand washing behaviour with soap was insufficient in all woredas.

Table 18: Use of Soap for washing hands

Hand washing occasion [%]	Overall (n=398)	Kola Tembien (n=118)	Lalaey Adiabo (n=132)	Ganta Afeshum (n=148)
Washing children's hands	60.8	64.4	58.3	60.1
Washing hands after defecation	56.8	55.1	58.3	56.8
Washing hands after cleaning the child	36.9	36.4	36.4	37.8
Washing hands before feeding the child	38.4	39.0	34.8	41.2
Washing hands before preparing food	45.7	50.8	40.9	45.9
Washing hands before eating	40.5	43.2	37.9	40.5

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

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

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 19).

Table 19: Mentioned ways of washing hands

Hand-washing practice [%]	Overall (n=398)	Kola Tembien (n=118)	Lalaey Adiabo (n=132)	Ganta Afeshum (n=148)
Washes hands in a bowl of water (sharing with other people) without soap/ash	3.8	1.7	6.1	3.4
Washes hands in a bowl of water (sharing with other people) with soap/ash	16.3	28.0	9.1	13.5
Washes hands with someone pouring water from a jug onto one's hands or under running water without soap/ash	19.8	16.1	26.5	16.9
Washes hands with someone pouring water from a jug onto one's hands or under running water with soap/ash	60.1	54.2	58.3	66.2

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. Around ¾ of respondents (74.4%) mentioned that washing hands can avoid food poisoning. However, the most mentioned answer was "covering your food to protect it from flies" (96.0%) (Table 20). 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 3.1±1.1 (Kola Tembien 2.7±0.9, Laelay Adiabo 3.1±1.2, Ganta Afeshum 3.3±1.1.

Table 20: Mentioned ways to avoid food poisoning

Food poisoning can be avoided by… [%]	Overall (n=398)	Kola Tembien (n=118)	Lalaey Adiabo (n=132)	Ganta Afeshum (n=148)
Washing hands	74.4	79.7	69.7	73.5
Remove faeces from home and surrounding	70.6	57.6	73.5	78.4
Cover food to protect it from flies	96.0	95.8	97.7	94.6
Wash fruits and vegetables before preparation	34.9	18.6	38.6	44.6
SCORE (max 4) [mean±SD]	3.1±1.1	2.7±0.9	3.1±1.2	3.3±1.1

Prevalence of hygiene counselling at village level was assessed by asking the respondents if they ever received hygiene counselling. Coverage of hygiene counselling was high with 88.4% overall and the highest coverage in Ganta Afeshum with 97.3%, followed by Kola Tembien 83.1% and Laelay Adiabo 83.3%.

4.7. 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 31.2% (Kola Tembien 22.0%, Laelay Adiabo 44.7%, Ganta Afeshum 26.4%). Diarrheal episodes since birth were also highest in Laelay Adiabo with 2.3±1.4, followed by Kola Tembien 1.9±1.9 and then Ganta Afeshum 1.4±1.4 (overall 1.8±1.7). Overall, only 21.3% did not have any episodes of diarrhea since birth, which shows that diarrhoea is a constant problem among this population.

4.8. 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. As aforementioned, mean age of respondents was 27.7±6.5**. During their last pregnancy, respondents received antenatal care mean times of 4.1±1.4** (Kola Tembien 4.3±1.5, Laelay Adiabo 3.6±1.5, Ganta Afeshum). Only three respondents did not remember 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 69% of overall respondents** and alarmingly low in Laelay Adiabo with only 48.5% (Kola Tembien 75.4%, Ganta Afeshum 83.7%). The mean **number of under 5 clinic visits with the enrolled child was low with 4.2±1.1** (Kola Tembien 4.0±1.1, Laelay Adiabo 4.1±1.0, Ganta Afeshum 4.6±1.2). Children are supposed to visit the under 5 clinic **every month and participate in regular growth monitoring**. Considering the mean age of the children with 13.2 months, **the average number of clinic visits is insufficient and needs to be emphasized in future projects.** Family support in taking care of children was high in the overall survey region. Only 34.7% of respondents took care of their child alone (Kola Tembien 32.2%, Laelay Adiabo 35.6%, Ganta Afeshum (35.8%). As seen in Table 21, respondents were most often supported by older siblings of the child.

Table 21: Supporter in taking care of the child (6-23 months)

Care taker of the child [%]	Overall (n=398)	Kola Tembien (n=118)	Lalaey Adiabo (n=132)	Ganta Afeshum (n=148)
Respondent alone	34.7	32.2	35.6	35.8
Mother/ mother in law of respondent	23.6	23.7	18.9	27.7
Older siblings of the child	36.9	34.7	41.7	34.5
Others	4.8	9.3	3.8	2.0

4.9. Knowledge, attitudes and practices regarding complementary feeding

During the interview, the respondents were presented two pictures showing watery, dripping porridge and thick porridge (Figure 23). 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 in young children. Therefore, the correct consistency of porridge should be thick and should not be dripping from a spoon. T**hin, watery porridge was preferred by 53% of women (Kola Tembien 58.5%, Laelay Adiabo 49.2%, Ganta Afeshum 51.0%)**. These results show that there is a high uncertainty about what is the appropriate consistency of porridge.

Figure 23: 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 (**89.7%) knew that adding fat will make porridge more nutritious**. The benefits of animal source foods (ASF) as well as pulses or green leafy vegetables were known by around 20-40% of respondents (Table 22). However, mothers reported that they consider vitamin A rich vegetables or green leafy vegetables not as a food to mix into the porridge, but to give as a side dish.

Table 22: Mentioned types of food making porridge more nutritious

Additions to porridge [%]	Overall (n=398)	Kola Tembien (n=118)	Lalaey Adiabo (n=132)	Ganta Afeshum (n=148)
Animal sourced food	47.7	46.4	46.2	50.0
Pulses	46.5	44.1	39.4	54.7
Vitamin A-rich fruits and vegetables	20.4	16.9	17.4	25.7
Green leafy vegetables	24.4	23.7	23.5	25.7
Oil/ fat	89.7	78.0	91.7	97.3
SCORE max 5 [mean±SD]	2.3±1.3	2.1±1.3	2.2±1.2	2.5±1.3

The mean number of mentioned types with a maximum of five possible answers was 2.3±1.3 (Kola Tembien 2.1±1.3, Laelay Adiabo 2.2±1.2, Ganta Afeshum 2.5±1.3).

When asked to freely recall **signs of malnutrition**, 92% of the respondents mentioned weight loss/thinness and 66% lack of energy/weakness as signs of malnutrition (Table 23, p. 33). Growth faltering, which is very common in the survey region, was only recognized as sign of malnutrition by 31.7% of the women. The mean number of mentioned signs of malnutrition was 2.5±1.0 (Kola Tembien 2.4±0.9, Laelay Adiabo 2.6±1.0, Ganta Afeshum 2.6±1.0).
Most commonly known **reason for malnutrition** was not getting enough food (95.2%). Watery food with

lack of nutrients was mentioned by around 50% which was similar to the uncertainty of the appropriated consistency of porridge. Unmet higher energy- and nutrient-requirements during episodes of illness as reason for malnutrition were known by around half of the respondents (Table 23). The mean number of mentioned reasons for malnutrition was 2.0±08 (Kola Tembien 1.8±0.7, Laelay Adiabo 2.1±0.8, Ganta Afeshum 2.0±0.8).

Table 23: Mentioned signs and reasons of malnutrition

Signs of malnutrition [%]	Overall (n=398)	Kola Tembien (n=118)	Lalaey Adiabo (n=132)	Ganta Afeshum (n=148)
Lack of energy/ weakness	66.3	65.3	66.7	66.9
Weakness of the immune system	64.3	61.9	62.9	67.6
Loss of weight/ thinness	91.3	88.1	91.7	93.2
Growth faltering in children	31.7	22.9	37.1	33.8
SCORE max 4 [mean±SD]	2.5±1.0	2.4±0.9	2.6±1.0	2.6±1.0
Reasons of malnutrition [%]				
Not getting enough food	95.2	95.8	93.2	96.6
Watery food with lack of nutrients	51.8	44.9	54.5	54.7
Illness and not getting enough food	50.5	42.4	59.1	49.3
SCORE max 3 [mean±SD]	2.0±08	1.8±0.7	2.1±0.8	2.0±0.8

Furthermore, respondents were asked to freely recall how to prevent malnutrition among young children (6-23 months). The majority of respondents knew that giving more food (75.4%) and giving diverse foods (88.9%) can prevent malnutrition. Least know prevention measure was attending growth monitoring (32.2%) (Table 24). The mean number of ways to prevent malnutrition was 3.2±1.1 (Kola Tembien 2.7±0.9, Laelay Adiabo 3.1±1.2, Ganta Afeshum 3.3±1.1).

Table 24: Mentioned ways to prevent malnutrition in young children (6-23months)

Prevention of malnutrition	Overall (n=398)	Kola Tembien (n=118)	Lalaey Adiabo (n=132)	Ganta Afeshum (n=148)
Give more food	75.4	83.1	75.8	68.9
Give diverse food each day	88.9	83.9	89.4	92.6
Feed frequently	68.6	66.9	65.2	73.0
Give attention during meals	52.8	46.6	52.3	58.1
Attend growth monitoring	32.2	16.1	39.4	38.5
SCORE max 5 [mean±SD]	3.2±1.1	2.7±0.9	3.1±1.2	3.3±1.1

Respondents were further asked about their feeding practice regarding amounts of fluids (including breast milk) and food offered during episodes of illness (Table 25, p. 34). 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 30% of respondents were offering nothing, much less or somewhat less to drink during episodes of illness. Furthermore, around 28% were offering nothing, much less or somewhat less foods during episodes of illness. Positively, more than half of the respondents stated offer more fluids and more food during illness. Around 5% of children have never been sick.

Table 25: Amount of fluids and food offered during illness

Amount of fluids offered during illness [%]	Overall (n=398)	Kola Tembien (n=118)	Lalaey Adiabo (n=132)	Ganta Afeshum (n=148)
nothing	1.5	0.0	0.8	3.4
much less	7.1	8.5	8.5	4.7
somewhat less	24.1	23.1	31.5	18.2
about the same	7.8	4.3	10.8	8.1
more	53.7	59.8	46.9	54.7
Amount of food offered during illness [%]	**Overall (n=398)**	**Kola Tembien (n=118)**	**Lalaey Adiabo (n=132)**	**Ganta Afeshum (n=148)**
nothing	1.8	0.0	2.3	2.7
much less	7.1	8.5	6.9	6.1
somewhat less	19.1	20.5	23.8	15.5
about the same	8.3	5.3	11.5	7.4
more	53.0	55.9	50.0	53.4

4.10. 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. The majority of respondents stated to have a nutrition counselling structure in their village with health extension workers covering most of the nutrition counselling. Some villages had additional volunteer groups or agricultural extension service (Table 26). Around 10% reported not to have a nutrition counselling structure in their village. Most of them were respondents of Kola Tembien. However, other respondents of the same villages or kebelles mentioned to have a nutrition counselling structure. Thus, awareness of the existence of such nutrition counselling structures should be increased.

Table 26: Counselling structure for nutrition in the village

Nutrition counselling structure [%]	Overall (n=398)	Kola Tembien (n=118)	Lalaey Adiabo (n=132)	Ganta Afeshum (n=148)
Health extension worker	86.9	79.7	85.6	93.9
Volunteer group	47.3	39.8	42.4	57.4
Agricultural extension service	10.3	13.6	6.8	10.8

Usage of nutrition counselling structures and receiving nutrition counselling was medium in the survey region with 19% of mothers not receiving nutrition counselling (Table 27, p. 35). Respondents were further asked whether they have received cooking demonstrations and whether it improved their knowledge on and complementary feeding practice. Around 1/3 of respondents had already participated in cooking demonstrations (overall 33.9%, Kola Tembien 22.5%, Laelay Adiabo 28.0, Ganta Afeshum 45.9) and around 2/3 of these participants felt that their knowledge and practical skills have improved (Figure 24, p. 35).

Table 27: Received nutrition counselling among respondents

Source of nutrition counselling [%]	Overall (n=398)	Kola Tembien (n=118)	Lalaey Adiabo (n=132)	Ganta Afeshum (n=148)
Health extension worker	78.1	79.7	85.6	93.9
Volunteer group	36.9	39.8	42.4	57.4
Agricultural extension service	5.3	13.6	6.8	10.8

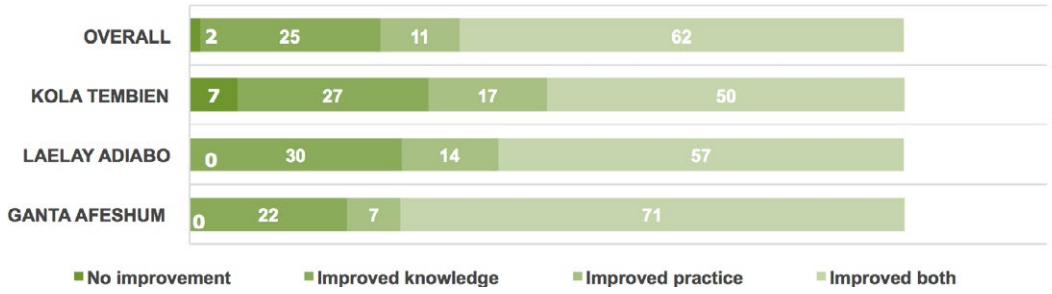

Figure 24: Cooking demonstrations and their impact [%]

Counselling was highest in Ganta Afeshum for both hygiene and nutrition counselling. This may also be reflected in the overall higher knowledge scores in that woreda compared to the other two. Future projects should ensure or create availability of nutrition counselling and control for compliance among communities.

4.11. Dietary diversity of women 15-49 years

The **mean IDDS-W was 3.1±0.9,** meaning that on average, 3.1 different food groups were consumed the day before the interview (Figure 25, p. 36). Mean food scores did not differ greatly among woredas, but was highest in Ganta Afeshum with 3.2±0.9, followed by Kola Tembien with 3.1±1.1 and Laelay Adiabo with 3.0±0.8.

In regard to **MDD-W**, only 6.8% of the women achieved a minimum dietary diversity **of ≥5 different food groups**. In Laelay Adiabo, the situation was even worse with only 4.5% achieving MDD-W, whereas in Ganta Afeshum 8.1%, and in Kola Tembien 7.6% achieved MDD (Figure 26, p. 36). However, all numbers are low and indicates that nutrient adequacy is not achieved by most of the women which needs to be urgently addressed in up-coming projects.

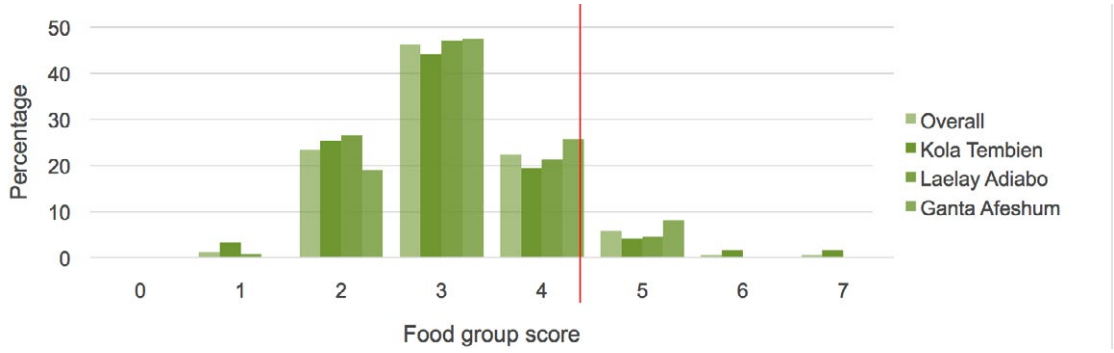

Figure 25: Number of food groups consumed by women 15-49 years (red line indicates percentage of women achieving minimum dietary diversity scores)

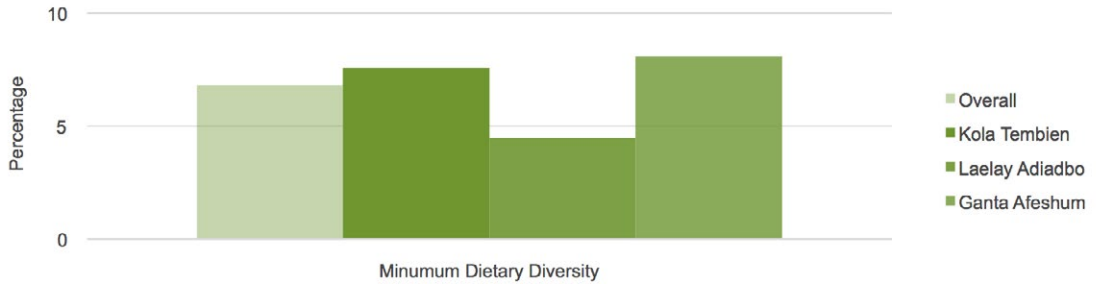

Figure 26: Minimum Dietary Diversity in women

Figure 27, p. 37, shows that all women consumed starchy staple foods. The majority of all women consumed food items from the food groups other vegetables. In regard to differences between woredas, legumes were mostly consumed in Ganta Afeshum (90%), flesh foods in Laelay Adiabo (46%) and Kola Tembien (37%). Eggs were mostly consumed by women in Kola Tembien. Consumption of dairy products was low with 12% in the overall survey region. Food items from the group “other fruits; nuts and seeds, dark green leafy vegetables; vitamin A rich fruits and vegetables, and other fruits”, were almost negligible among women. 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 up-coming projects. During observations at markets, such food groups were available and sold by several food vendors (Figure 28, p. 37). Barriers for not purchasing such foods need to be assessed and addressed in future projects.

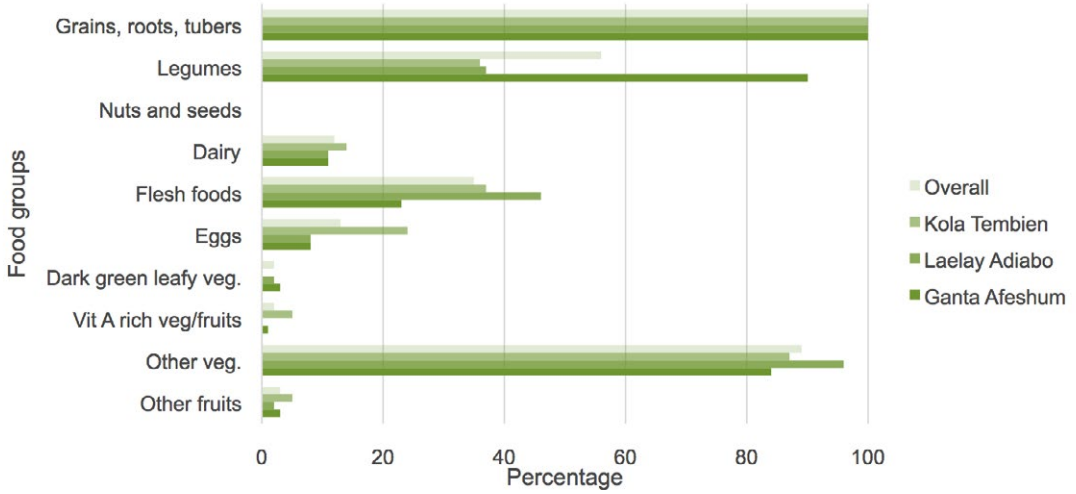

Figure 27: Prevalence of consumed food groups by women aged 15-49 years

Figure 28 Vegetable sellers on market day

Fasting

Respondents were further asked, whether **their food intake yesterday was different than usual or whether it was a fasting day** (Figure 29, p. 38). During the time of the survey, regular fasting days (no consumption of animal products) were **Wednesdays and Fridays**. Almost 13% of women had a fasting day prior to the interview. Around 1% stated to be sick or be on a diet which altered the food intake. **During celebrations, food intake is often even more divers and includes meat as a form of special food.** *No information on pregnancy status was acquired in the current setting. It is recommended to assess the current fasting regimen among pregnant and lactating women during the long time fasting periods, i.e. before Easter and Christmas. Just recently, the Orthodox Church released an announcement that it will be allowed and recommended to women who are pregnant and/or lactating to consume animal source foods also during fasting days and periods.*

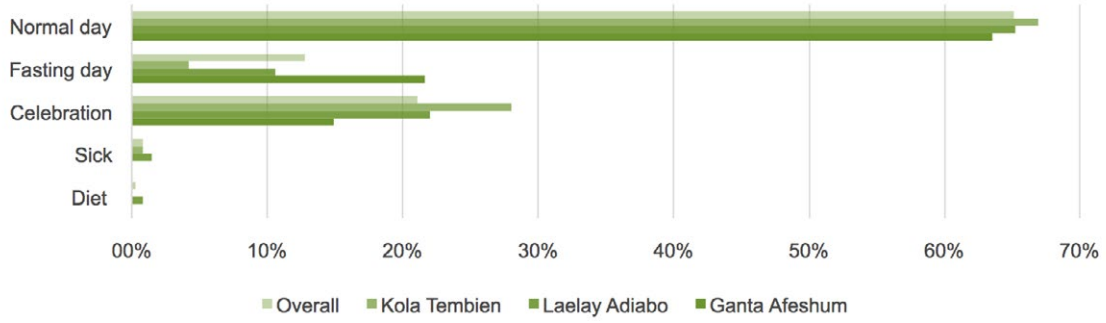

Figure 29: Food intake in relation to usual and unusual food intake

4.12. Information on Children aged 6-23 months

The mean age of children between 6 and 23 months was 13.15±5.0 months. Half of these children were girls (51%) with a slightly higher percentage in Kola Tembien (52.7%) and Ganta Afeshum (52.7%) than in Laelay Adiabo (47.7%).

4.13. 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 (98.7%) were ever breastfed with no difference between woredas. **Ninety-seven percent gave breast milk after birth which was reported in all three woredas.** At the time of the survey, 93.7% of all children were still being breastfed (Kola Tembien 94.9%, Laelay Adiabo 93.2%, Ganta Afeshum 93.2%). Children had a mean age of 6.4±1.2 months when they were first introduced to liquids or foods other than breast milk. In all three woredas, mean age was over 6 months of age (Annex K. p. 79). Around 6% were introduced to other liquids or food prior to reaching the age of 6 months (Kola Tembien 9.3%, Laelay Adiabo 3.3%, Ganta Afeshum 2.8%). 25 children (6%) did not yet receive any other foods or liquids apart from breast milk. Around 21% were older than 6 months of age, when other foods or liquids were introduced into the child's diet (Kola Tembien 15.7%, Laelay Adiabo 27.6%, Ganta Afeshum 21.3%). *Mothers and other care takers have to be educated on the importance of introducing other foods and liquids at the age of 6 months and not to delay complementary feeding as the infant's needs for nutrients exceeds nutrient density of breast milk.*

The WHO recommends to disaggregate and report **IYCF (infant and young children feeding practice) indicators for the age groups of 6-11 months, 12-17 months and 18-23 months (WHO 2007). Predominantly, the number of children being breastfed was the highest for the youngest age group, i.e, 6-11 months (96.5%) followed by children between 12-17 months (89.7%). In total, 74.9% of the children between 18-23 months were still being breastfed.** The WHO recommends continuing with breastfeeding until the age of two years (WHO 2001), which was therefore met by more than ¾ of children in the oldest age group (Table 28).

Table 28: Prevalence of breastfed children disaggregated into WHO age-groups

Children being breastfed [%]	Overall (n=398)	Kola Tembien (n=118)	Lalaey Adiabo (n=132)	Ganta Afeshum (n=148)
6-11 months (n=175)	96.6	96.9	96.4	96.4
12-17 months (n=121)	99.2	100	97.7	100
18-23 months (n=102)	82.4	83.3	81.8	82.2

Individual Dietary Diversity Score

Mean IDDS-C of children 6-23 months was 2.4±1.3 (see Annex F, p. 60), with only marginal differences between woredas (Kola Tembien 2.4±1.4, Laelay Adiabo 2.3±1.3, Ganta Afeshum 2.5±1.3). Figure 30 presents the number of food groups consumed by children (6-23 months) the day before the interview. Disaggregated according to breastfeeding status, IDDS-C was lower among breastfed compared with non-breasted children (breastfed 2.4±1.3, non-breastfed 3.0±1.0) (see Annex G and H, p. 60).

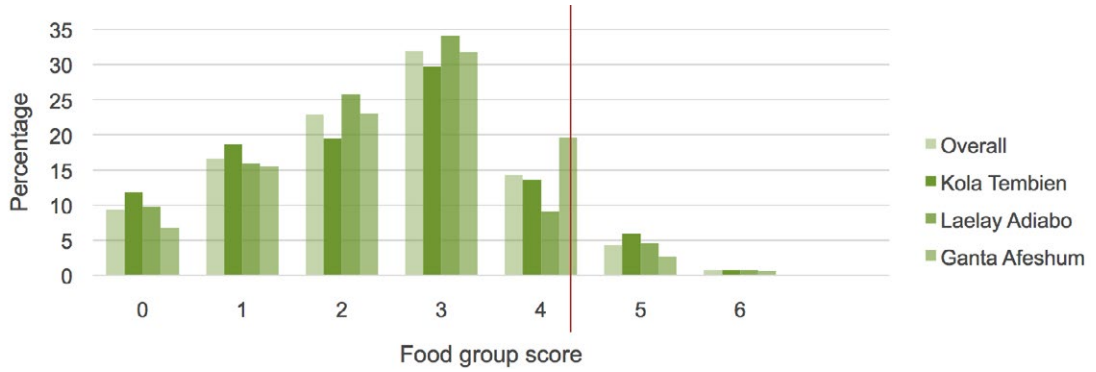

Figure 30: Number of Food Groups consumed by children (6-23 months)

Figure 31, p. 40, shows the distribution of consumed food groups among children 6-23 months. Almost 90% of children consumed grains, roots and tubers (88.9%). The second most consumed group was “other fruits and vegetables” with 58.3% of all children. Consumption of legumes was highest in Ganta Afeshum 62.8% which was similar to the mothers. Around 20% of children consumed eggs and/or dairy products. Consumption of flesh foods was highest in Kola Tembien which was also similar in the group of mothers. Consumption of vitamin A rich fruits and vegetables was low in all three woredas. Detailed information on percentages can be found in Annex K, p. 81.

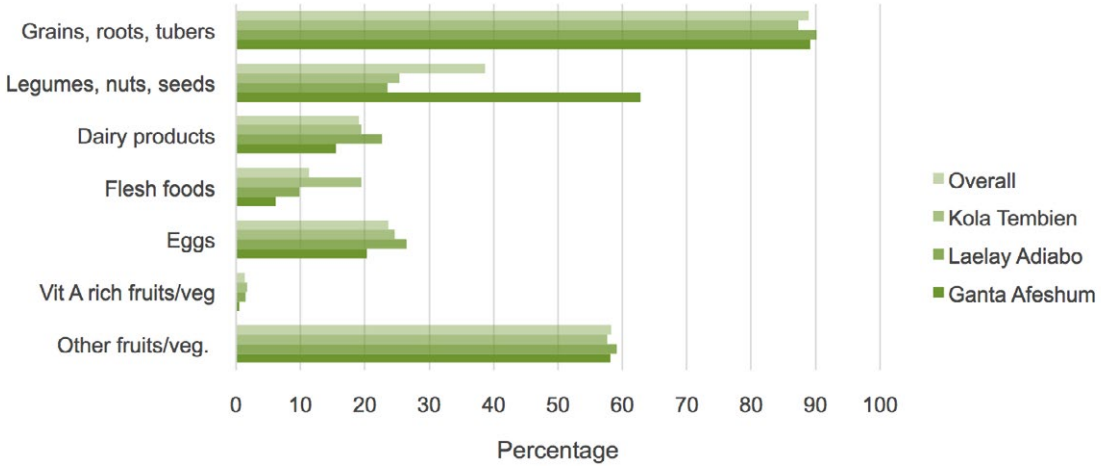

Figure 31: Percentage of consumed food groups all children 6-23 months

MDD - Minimum Dietary Diversity

Less than 20% of all children (6-23 months) achieved minimum dietary diversity of **equal or above 4 different food groups** consumed the day before the interview (19.3%). Laelay Adiabo had the lowest percentage of children achieving MDD with 14.4%, followed by Kola Tembien with 20.3% and Ganta Afeshum with 23.0%.

MMF - Minimum Meal Frequency

Respondents reported that 94.3% of the children received any kind of food apart from breast milk the previous 24 hours. The remaining only received breast milk due to not having started complementary feeding yet or due to sickness. Mean feeding frequency for children (6-23 months) was 2.7±1.3 (see Annex I, p. 60). The percentage of children being fed the minimum numbers of times was highest in Kola Tembien with 66.9%, followed by Laelay Adiabo 68.2%, and Ganta Afeshum with 64.2%. Disaggregated according

to breastfeeding status, 67.8% of overall breastfed children and 44.0% of overall non-breastfed children achieved MMF (Kola Tembien 69.6%;16.7, Laelay Adiabo 68.3%; 66.7, Ganta Afeshum 65.9%; 40.0%, respectively).

MAD - Minimum Acceptable Diet

The WHO indicator **MAD** includes all children ≥6 months who at least received the **MDD of 4 different food groups** and the minimum age appropriate meal frequency apart from breast milk during the previous day. Overall, 17.1% achieved MAD (Kola Tembien 19.5%, Laelay Adiabo 12.1%, Ganta Afeshum 19.6%). Among breastfed children, 18% received MAD whereas among non-breastfed children only 4% achieved MAD. Table 29, p.41, presents the percentage of children achieving MDD, MMF and MAD. As seen in Figure 32, p. 41, **the bottleneck to achieve MAD is MDD in all three woredas rather than MMF.** Laelay Adiabo had the lowest percentage of children achieving MAD, which was similar to the results of MDD-W.

Table 29: Children (6-23 months) achieving MDD, MMF and MAD

IYCF Indicator [%]	Overall (n=398)	Kola Tembien (n=118)	Lalaey Adiabo (n=132)	Ganta Afeshum (n=148)
Minimum dietary diversity (MDD)	19.3	20.3	14.4	23.0
breastfed (n=373)	19.3	21.4	13.8	22.5
non-breastfed (n=25)	20.0	0.0	22.2	30.0
Minimum meal frequency (MMF)	66.3	66.9	68.2	64.2
breastfed (n=373)	67.8	69.6	68.3	65.9
non-breastfed (n=25)	44.0	16.7	66.7	40.0
Minimum acceptable diet (MAD)	17.1	19.5	12.1	19.6
breastfed (n=373)	18.0	20.5	12.2	21.0
non-breastfed(n=25)	4.0	0.0	11.1	0.0

Figure 32: Infant and Young Child Feeding Indicators and

Minimum Dietary Diversity Women

WHO recommends to disaggregate and report IYCF indicators for the age groups of 6-11 months, 12-17 months and 18-23 months since they can vary widely between these age groups (WHO 2007). Dietary diversity was lowest among the youngest children (6-11 months) resulting in low prevalence of MAD despite many children achieving MMF (Table 30, p. 42). Children in the age group 18-23 months had the highest prevalence of MAD since dietary diversity was increased (MDD) and meal frequency was sufficient (MMF). The oldest children (age group 18-23 months) had the highest MDD, but still a low MAD due to insufficient meal frequency (low MMF). In this survey region, MDD is the key indicator in increase overall MAD. *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.

Table 30: IYCF Indicators disaggregated into age groups

IYCF Indicator [%]	Overall (n=398)	Kola Tembien (n=118)	Lalaey Adiabo (n=132)	Ganta Afeshum (n=148)
6-11 months (n=175)				
MDD	12.6	14.1	7.1	16.4
MMF	57.1	53.1	64.3	54.5
MAD	11.4	12.5	7.1	14.5
12-17 months (n=121)				
MDD	22.3	26.7	20.9	20.8
MMF	69.4	83.3	69.8	60.4
MAD	19.8	26.7	16.3	18.8
18-23 months (n=102)				
MDD	27.5	29.2	18.2	33.3
MMF	78.4	83.3	72.7	80.0
MAD	23.5	29.2	15.2	26.7

Respondents were asked if the enrolled child's recorded food intake was different from usual. Only 8.7% of respondents told that the child's food intake was different. Celebration or being sick were mentioned most for deviations from usual food intake (Figure 33).

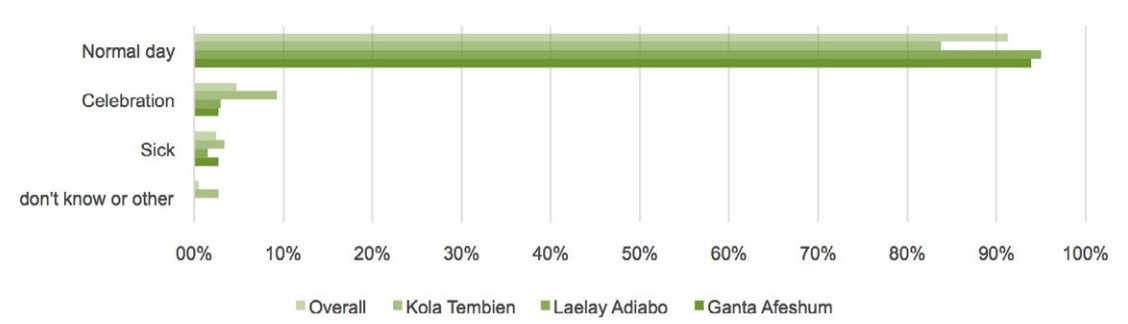

Figure 33: Usual food intake

Although knowledge on how to enrich porridge and prevent malnutrition was available in the survey region, **feeding practices were insufficient**. Knowledge among mothers on how to nutritionally enrich porridge needs to be enhanced 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. *Further, gaps between knowledge and practice need to be investigated, e.g. through qualitative research. Such research help to identify barriers of appropriate feeding practices, but also drivers of proper feeding practices by women.*

4.14. General Observations (by research team) and challenges

As agreed during the preparation of the survey it was decided that the current NBS will not include observations of mothers or children at the end of the interview. However, general observations of the study area were done by the research team.

- The overall study area was strongly affected by **drought and difficult arable land which are very rocky and hilly.**
- **Households are very scattered** which will also be a challenge in future projects. Village volunteers were needed to identify eligible households and to find the direction to the respective households. In future project, a per diem is advised for the support of such volunteers.
- Due to conducting the interviews **with mixed teams** (one female and one male), mothers felt comfortable to answer all questions of the questionnaire. In addition, working in a team of two enumerators increased the safety of each team in regard to street dogs, difficult pathways, and long distances to cover when going from household to household.
- Almost ¾ of households kept animals, which was also reflected by the **overall overgrazed** survey region.
- In addition, animals were kept within the homestead, and thus, **animal faeces was present in most of these households**. Although improved **sanitation facilities** were available, many of them **were broken** or had empty water stands for hand washing.
- In regard to dietary diversity, **vitamin A rich plants, such as pumpkin and carrots** were grown by some households, and **may be promoted** in terms of production and consumption within future projects.
- **Swa, locally brewed beer** out of grains, is often consumed by pregnant women and young children in the project region. Although inhabitants reported that this kind of swa did not contain a lot of alcohol, the alcohol content should be analysed and swa should not be recommended to be consumed by pregnant or lactating women and young children.

4.15. Summary

Table 31: Summary of study results with main and project specific indicators

Indicator \ Study area	Overall n=398	Kola Tembien n=118	Laelay Adiabo n=132	Ganta Afeshum n=148
Dietary diversity women (10 food groups)				
IDDS-W [mean±SD, (Min-Max)]	3.1±0.9 (1-7)	3.1±1.1 (1-7)	3.0±0.8 (1-5)	3.2±0.9 (2-5)
MDD-W [%]	6.8	7.6	4.5	8.1
Dietary diversity children (7 food groups)				
IDDS-C [mean±SD, (Min-Max)]	2.4±1.3 (0-6)	2.4±1.4 (0-6)	2.3±1.3 (0-5)	2.5±1.3 (0-6)
MDD [%]	19.3	20.3	14.4	23.0
MMF [%]	66.3	66.9	68.2	64.2
MAD [%]	17.1	19.5	12.1	19.6
HFIES (classification) [%]				
Food secure	32.2	26.3	33.3	35.8
Mildly food insecure	48.7	46.6	56.1	43.9
Moderately food insecure	17.8	24.6	10.6	18.9
Severely food insecure	1.3	2.5	0.0	1.4
Crop diversity scores [mean±SD]				
Crops	3.9±1.9	4.9±2.2	3.4±1.2	3.6±1.7
Vegetables	2.6±1.6	2.4±1.5	2.4±1.5	3.1±1.8
Fruits	1.4±0.8	1.6±0.9	1.5±0.8	1.2±0.6
WASH [%]				
Improved drinking water (dry season)	82.2	94.9	84.9	69.6
Improved sanitation facility	12.3	11.9	3.0	20.9
Washing hands with soap	76.4	82.2	67.4	79.7
Received hygiene counselling	88.4	83.1	83.3	97.3
Knowledge scores [mean±SD]				
Enriching porridge, max 5	2.3±1.3	2.1±1.3	2.2±1.2	2.5±1.3
Signs of malnutrition, max 4	2.5±1.0	2.4±0.9	2.6±1.0	2.6±1.0
Reasons of malnutrition, max 3	2.0±0.8	1.8±0.7	2.1±0.8	2.0±0.8
Prevent malnutrition, max 5	3.2±1.1	2.7±0.9	3.1±1.2	3.3±1.1
Prevent infection, max 5	3.1±1.1	2.7±0.9	3.1±1.2	3.3±1.1
Received nutrition counselling [%]	80.9	77.1	73.5	90.5

5. CONCLUSIONS & RECOMMENDATIONS

The current nutrition baseline survey, which was conducted in January and February 2016, describes the nutrition and food security situation of households of three selected woredas (Kola Tembien, Laelay Adiabo, Ganta Afeshum) in the Tigray Region, Ethiopia. Conclusions and related recommendations are presented in accordance to the causal model of malnutrition (UNICEF 1990) and its underlying as well as immediate causes of malnutrition. In addition, results are available as an excel file (overall and disaggregated into woredas) for M&E activities and planning.

Conclusions	Recommendations
Food and nutrition security situation To assess food security of the households, the standardised **Household Food Insecurity Experience Scale** was applied in the post-harvest season (4 months after the harvest) (FAO 2015). **32.2%** of respondents were categorised as **food secure** and most respondents (**48.7%)** were categorized as **mildly food insecure**. In 2015, the harvest was very low due to limited rainfall which may be represented in the high number of food insecure households. Participation in **agricultural development programmes** was mentioned by **55%**, in **food aid programmes by 20%**. Households in Ganta Afeshum had the highest participation in such programmes which may be reflected by the fact that most food secure households were found here. Thus, participation in such programmes might depict one aspect to achieve or ensure food security. Nevertheless, also the highest percentage to **rely on public transfer** – was found **in Ganta Afeshum** (overall 40.9%).	**Activities** • Social and/or cash transfers programmes, especially after pro-longed droughts should be evaluated to balance food shortages at household level • Investigation of the specific causes of food insecurity through qualitative research methods and in-depth interviews with household members and community leaders (crop diversity, availability of qualitative food the market, knowledge to buy adequate food, barriers to buy food, etc.) • Identification of feasible and sustainable copying mechanism (e.g. food sharing (if food surplus) among households/communities) **Monitoring** • Regular assessments of levels of food insecurity throughout the year (subsample in all districts, every 4 months)
Concerning the immediate causes of malnutrition: **Food intake (food use)** **Fasting:** Ethiopia has **180 fasting days** during 7 official fasting periods. In addition, **Wednesday and Fridays,** except for the 55 days after Easter (and other exceptions), **are fasting days**. Most mothers reported to conduct fasting which may increase their risk to develop nutrient deficiencies especially during the long lasting fasting periods. **Individual dietary diversity score of women was 3.1±0.9 food groups**. Most consumed food groups were “grains, roots and tubers”100%, “other vegetables” 90%, protein sources are “legumes”56%, “flesh food” 37% and “eggs and dairy products” 12-13%). Only **6.8% of women achieved minimum dietary diversity.** This shows that more than 90% of women did not have a nutrient adequate diet the day prior to the interview which needs to be urgently addressed in the up-coming nutrition programs.	**Activities** **Nutrition education** on: • continued breastfeeding after the child reaches six months of age is recommended in addition to complementary feeding. • on the importance of introducing other foods and liquids at the age of 6 months and not to delay complementary feeding. • on the importance vitamin A-rich fruit and vegetables: provide information regarding the nutritional benefits and value of vitamin A-rich fruit and vegetables especially dark green leafy vegetables (for all family members)

Conclusions	Recommendations
Individual dietary diversity score among children was 2.4±1.3. Most consumed food groups were "grains, roots and tubers (88.9%)", "other fruit and vegetables (58.3%)". **Main source for protein** were pulses and dairy products, consumed by around 60% ("legumes and nuts (40%)"and "eggs and dairy products (20%)"). **Consumption of vitamin A ric**h fruits and vegetables was low in all three woredas. **Minimum dietary diversity** (**MDD**) was only achieved by **19.3%.** The observed prevalence of the current MDD was higher than the national rate of 10.8% (DHS 2011). **66.3%** of the children achieved minimum feeding frequency (national rate = 44.7% (DHS 2011). However, it is still too low and needs to be addressed to improve nutrient adequacy and proper development of the children. Overall, only **17.1% achieved minimum acceptable diet** (18% of breast-fed children, and 4% of non-breastfed children). **Breastfeeding rate was good in all woredas**: At the time of the survey, 93.7% of all children were still being breastfed. 97% gave breast milk (colostrum) after birth. Children had a mean age of 6.4±1.2 months when they were first introduced to liquids or foods other than breast milk. However, some children were too old for receiving breast milk only.	• **Assess availability of vitamin A-rich fruits and vegetables at market places.** • **Promote purchasing of vitamin A-rich fruits and vegetables** • Promote consumption **of protein-rich foods in children** Qualitative interviews should be conducted to identify barriers of eggs (13% do not eat any eggs), legumes and dairy product consumption. • **Conduct cooking demonstrations** with locally available foods. Prepared dishes should contain at least three different food groups from the FAO food group table. **HFIES and food group score:** A comparison of values assessed by the Household Food Insecurity Experience Scale (HFIES) and dietary diversity scores shows that dietary diversity among both target groups was highest amongst food secure households (Table 32, p. 49). **Monitoring** • Regular assessment of children's and women's dietary diversity as well as MDD-W and MAD throughout the year (subsample, every 4 months together with HFIES)
Health status (food utilization) The severity of shortcomings regarding the WASH sector (water sanitation hygiene) is reflected in the **high prevalence and frequency of diarrhoea** in children. 31.2% of the children under two years of age were suffering from diarrhoea within two weeks prior the survey (Kola Tembien 22.0%, Laelay Adiabo 44.7%, Ganta Afeshum 26.4%). Diarrheal episodes since birth were also highest in Laelay Adiabo with 2.3**±1.4, followed by Kola Tembien 1.9±1.9 and then Ganta Afeshum 1.4±1.4 (overall 1.8±1.7).** Overall, only 21.3% did not have any episodes of diarrhea since birth, which shows that **diarrhoea is a constant problem among this population.**	**Activities** • 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 promotors at village level). • Ensure adequate treatment is available as well as asked for by mothers regularly (monthly growth 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. **Monitoring** • Treatment facilities (availability, proximity, and equipment) • Consultation of treatment facilities by mothers
Concerning the underlying causes **Availability** of food through own agricultural production and trade **Land availability** A total of **94.7% of respondents had access to land** (Kola Tembien 94.1%, Laelay Adiabo 97.0%, Ganta Afeshum 93.2%), where they mostly grew grains. **Crop diversity** was 3.9±1.9 with a high frequency of grain (maize (69.8%), teff (60.5%), Barley (49.9%) and finger millet (40.6%)) as the main crop. Legumes (42.7%) is the second most present crop followed by nuts and seeds (e.g. noug 9.8% and 27% in Kola Tembien). **Diversity seemed to be highest in Kola Tembien.** Other staples like Irish potato or orange fleshed potato were not common (<5%). **Ownership of home gardens was high (70%).** In the overall study area, most cultivated vegetables were **tomatoes (66%), green pepper (75%), onions (38%), lettuce (31%) and garlic (28%)**. However, type of vegetables differed between woredas. **Diversity seemed to be highest in Ganta Afeshum,** with also the highest access to irrigated land. Vegetable diversity score, mean±SD: 2.6±1.6. The biggest challenge is that most cultivated crops are grown on rain-fed land which does not assure a year-round accessibility of vegetables on household garden level. **25% of respondents had access to fruits or fruit trees** with the highest percentage in Ganta Afeshum (Beles (cactus fig) is very common (91%)). However, this fruit is not available throughout the year. In the other woredas, mango, guava, and citrus trees were more common. In all three woredas, existence of wild fruit trees **was observed**. Fruit diversity score, mean±SD: 1.4±0.8. However, fruits were only very few consumed by women and children. **Livestock keeping was very common in all three woredas**, with over **90% of households keeping either shoat (65%), cattle (85%), or chicken (85%)**, or a combination of these.	The project has good potential to invest in nutrition sensitive agriculture. Almost all have access to land as well as home gardens. However, arable land is very rocky, mostly only rain-fed, and is ploughed with the help of cattle and donkeys. **Activities** • Erosion protection measures • Assess who is making decisions of what to grow on the arable land. • Encourage households/communities to grow and maintain a variety of crops for own consumption and income generation. In this regard, assess whether conservation of foods such as drying for cash income. With the additional cash income, high quality food could also be purchased (requires nutrition education to make informed choices). • Support of existing home gardens and encouragement of households to establish a home garden through provision of gardening tools, and or starter seed kits • Linking agricultural activities, identifying and strengthening local women's groups such as mom to moms, around home gardens could be an entry point for introducing nutrition aspects into agriculture • Promotion of production of carrots, pumpkins, Swiss chard • Promotion of consumption of carrots, pumpkins, Swiss chard • Improvement and maintenance of infrastructure in villages (roads, shops, electricity supply) • Assess availability of wild fruits trees and promote consumption of wild fruits • Work with community based approaches • Tailor activities to specific needs of woredas • Conduct training/activities in every kebele • Evaluate and possibly promote possibilities to consume animal sourced foods during fasting days

Conclusions	Recommendations
Access to food and food safety **Main sources of income** throughout the last year were sale of crops (57.5%) sale of animals/animal products (56.5%), temporary salary (45.2), but also public transfer such as cash for food or work (38.7%). Only 5% of the surveyed households had a regular salary. On average, **households depended on 2.4±1.0 different income sources.** Only a **small percentage of all respondents stored vegetables**, i.e. 11.2% (n=23) and only 21% of these reported problems with storage. **Only 12% (n=25) stated to process their vegetables after harvesting**, with all naming drying as the choice of processing. 16% (n=33) reported post-harvest losses. Main affected crops were green pepper and tomatoes. These results show that training and information on storage and processing of food crops is needed in the study area. **97.9% applied some fertilizer, herbicide, or pesticide** to their crop production. Most of them mixed compost with some chemical fertilizer. However, the high use of chemicals depicts a health hazard for consumers.	**Activities** • Improve availability of crops or products throughout the year to ensure income by • Evaluating processing and storage capacities of households • Teaching activities on storage and processing of crops • Measure pollution of crops due to use of chemicals • Promote integrated pest management to decrease usage of chemicals in crops production **Monitoring** • Percentage of trained households who apply storage and processing techniques

Care behaviour
The **educational status** of the survey participants was **lower** compared to national data with **54.5%** vs. 48% of the women with **no formal education**. Formal education as well 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.
Nutrition counselling is available in project area (only 10% of surveyed villages do not have a nutrition counselling structure). Around 1/3 of respondents had already participated in cooking demonstrations (overall 33.9%, Kola Tembien 22.5%, Laelay Adiabo 28.0, Ganta Afeshum 45.9) and around 2/3 of these participants felt that their knowledge and practical skills have improved. However, in regard to low MAD and MMD-W rates, there seems to be a gap between knowledge and actual practice.
Main caretaker of young children are mothers. Around 65% of respondents were supported by other caretakers.
IYCF infant and young children feeding practice
Knowledge of appropriate complementary feeding in terms of dietary quality and consistency is a challenge.
1. Most mothers (53%) considered watery and nutrient-low porridge as adequate for young children 6-12 months of age
2. Knowledge about enriching porridge was generally limited. Almost all women (89.7%) knew that adding fat will make porridge more nutritious. The benefits of animal source foods (ASF, 48%) as well as pulses (47%) or green leafy vegetables (20%) were known by around 20-48% of respondents. *However, mothers reported that they consider vitamin A rich vegetables or green leafy vegetables not as a food to mix into the porridge, but to give as a side dish. On average, women knew 2 ways to enrich porridge.*
This demonstrates that knowledge and behaviour regarding pulses are in line, given the fact that around 40% of children consumed pulses the previous day. 48% of the respondents considered animal source foods (ASF) as a way to enrich porridge. The low consumption rates of ASF might therefore be caused by low access and availability of this food group.
3. Knowledge about causes, signs and prevention of malnutrition was limited. When asked to freely recall **signs of malnutrition**, 92% of the respondents mentioned weight loss/thinness and 66% lack of energy/weakness as signs of malnutrition (Table 23). Growth faltering, which is very common in the survey region, was only recognized as sign of malnutrition by 31.7% of the women.
Most commonly known **reason for malnutrition** was not getting enough food (95.2%). Watery food with lack of nutrients was mentioned by around 50% which was similar to the uncertainty of the appropriated consistency of porridge.
4. Diversifying the diet of their children to **prevent malnutrition** was mentioned by the majority 89% of the mothers and 75% of respondents knew that giving more food (75.4%) can prevent malnutrition. Least known prevention measure was attending growth monitoring (32.2%)
5. Especially during episodes of illness, appropriate child feeding is essential for convalescence and prevention of malnutrition. Positively, **more than half of the respondents stated to offer more fluids and more food during illness**. Nevertheless the half did not.
	Activities
	• Evaluate existence and access to educational programmes for women with incomplete schooling
	• School drop-outs from adolescent girls should be avoided and completing primary education as well as higher education should be encouraged
	• Ensure or create availability of nutrition counselling
	• Education on nutrition and hygiene needs to be strengthened in the communities:
	• nutritional and health value of diverse diets needs to be communicated
	• Invite women (and their husbands) and grandmothers to cooking demonstrations to explain
	• the appropriate porridge consistency
	• maximizing dietary diversity with local resources
	• nutritional value and benefit of available foods (e.g. green leafy vegetables, pulses, ASF)
	• encourage the continued breastfeeding of children up to two years of age
	• Assess barriers to apply available knowledge on feeding practices among mothers with qualitative interviews and group discussions on village level
	• Establish mobile growth monitoring on village level
	• Inform about feeding during illness
	Monitoring
	For monitoring purposes, it is recommended to consider the following KAP areas concerning the nutritional knowledge of women
	- improve nutritional value of porridge
	- recognize malnutrition
	- reasons for malnutrition
	- prevention of malnutrition
	- feeding behavior during illness
	Monitoring at individual level
	• **KAP survey** with subsample (1 villages randomly selected per Camp) 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) and sessions attended (informatio**n can be linked with knowledge test)**
	Monitoring at institutional level
	• 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)
	• Monitoring training of multipliers:
	  • assess knowledge of multipliers before and after training
	  • establish feed-back and support structure for multipliers during implementation
	  • encourage regular refresher trainings for multipliers

Conclusions	Recommendations
Hygiene counselling for hygiene behavior Coverage of **hygiene counselling** was high with **88.4%** overall and the highest coverage in Ganta Afeshum with 97.3%, followed by Kola Tembien 83.1% and Laelay Adiabo 83.3%. Overall, the **hand washing behaviour with soap was insufficient in all woredas.** 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. Respondents were asked to freely recall what they could do to avoid sickness from germs from human or animal faeces. Around ¾ of respondents (74.4%) mentioned that washing hands can avoid food poisoning. However, the most mentioned answer was "covering your food to protect it from flies" (96.0%).	**Activities** • Evaluate content of hygiene counselling • Assess barriers of using soap through qualitative research • Motivate households to remove faeces from homestead regularly and to keep animals from entering kitchen area **Monitoring** It is recommended to apply the following KAP areas concerning the hygiene knowledge of women - storage of water in households - ways to make water safer to drink - use of soap - steps of hand-washing - avoid food poisoning
Health services and WASH (water, sanitation, hygiene) During the wet season and dry season, **improved drinking water was accessible for 81.9% and 82.2%** of the surveyed households (Kola Tembien: 94.1%, 94.9%; Laelay Adiabo: 89.4%, 84.9%; Ganta Afeshum: 65.5%, 69.6%%, respectively). 8% had to go for more than 60 min to get drinking water (round-way). **In addition, respondents were asked how they would rate the quality of their drinking water**. Here, the majority (90.7%) rated their water as good quality. Overall 31.9% reported to have access to dirt water with the highest availability in Laelay Adiabo (43.2%) followed by Kola Tembien (28.0%) and Ganta Afeshum (25%). The majority of households were using an **unimproved sanitation** facility (87.7). At the time of the survey, **soap was available in 88.4% of the households** (Kola Tembien 84.7%, Laelay Adiabo 92.4%, Ganta Afeshum 87.8%).	**Activities** • Apply water filters for dirt water sources • Measure water quality at at least 3 drinking water sources per woreda • Check water stand pipes and fix broken stand pipes • Improve hand washing stand at household level (availability) ensure water and soap) • Fix broken toilets • Evaluate possibilities to improve sanitation facilities and water supply through group discussions at village level • Assess parasite contamination at drinking water sources **Monitoring** • Number of working stand pipes • Number of water filters applied and in use • Working hand-washing stands (water and soap)
Access to basic health services Children are supposed to visit the under 5 clinic **every month and participate in regular growth monitoring**. Considering the mean age of the children with 13.2 months, **the average number of clinic visits is insufficient with a mean of 4.2±1.1** (Kola Tembien 4.0±1.1, Laelay Adiabo 4.1±1.0, Ganta Afeshum 4.6±1.2). The recommended least number of **antenatal care visits of 4 times was achieved by 69% of overall respondents** and alarmingly low in Laelay Adiabo with only 48.5% (Kola Tembien 75.4%, Ganta Afeshum 83.7%).	**Activities** • Identification of barriers that prevent mothers and pregnant women to attend basic health service regularly (qualitative interviews) **Monitoring** • Antenatal care visits in project area • Growth monitoring visits

Table 32: Mean food group score at different levels of food insecurity (n=398)

	Household Food Insecurity Experience Scale			
Food Group Score [Mean±SD]	**Food secure n=128**	**Mildly food insecure n=194**	**Moderately food insecure n=71**	**Severely food insecure n=5**
Women	3.5±1.0	3.1±0.9	2.7±0.8	2.2±1.3
Children 6-23 months	2.7±1.3	2.3±1.3	2.1±1.2	2.0±1.4

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ANNEX

A. Overview of interventions in Tigray Region

S/N	Complete List of Actors	Project Woreda	Project Activities	Project duration
1	**IFHP**	Ofla, Alagie, Endamokoni, Enderta, Erob, Atsbi wenberta, L/machewu, N/ adeat, Adwa	**CMAM** • Capacity building • Review meeting • Training (TOT, Basic, Refreshing) • Technical mentor	September 2016
2	**MAM for MAM**	Raya azebo, Raya alamata, Ofla, K/ awulaelo, Hawuzen, s/samre, H/wejerat, T/abergele	Supplementary feeding on sweet potato	December 2015
3	**CONCERN**	.Kola-Tembien, Tselemti, T/tsa/emba, M/leke	**TSF,TFP** • Technical mentor • Capacity building • Joint supervision • Service linkage • Community mobilization • Supply and distribution/logistic	December 2015
		• Tanka Abergele	**Recovery project** • Capacity building • Support IGA • Irrigation	December 2015
		• Ts/Tsa/Emba, Gulomekeda, Ahferom, Mereb Leke, Were Leke	**Micro nutrient powder /IYCF** • Distribution and utilization MNP • Technical mentor	June 2017

4	**GIZ**	Kola-Tembien, L/Adiabo (Partially Implemented by Concern Worldwide) & Ganta-Afeshum	**Nutrition Sensitive Agriculture** • Promotion of increased agri. production & availability of diversified nutrient dense foods • Homestead gardening • Post-harvest processing/mgt • Bio-fortification **Nutrition BCC/IYCF Practices** • Cooking demonstrations • EBF & CF Promotion • WASH promotion (Sawyer water filter, provision of jerry cans & soaps) **System Strengthening** • Multi-sectoral Coordination **Capacity Building** • Trainings • Material Provision-CD utensils • Radio Broad cast education • Joint supervision	Up to December 2017/19
5	**CIP**	H /wejerat, Enderta, S/Samre, T/abergele, K/Tembien, M/leke, G/Afeshum, Gulomekeda, Hawuzen	**Nutrition agriculture sensitive** • Nutrition education/promotion • Capacity building • Orange color sweet potato distribution • School feeding, gardening • Research with mekele university on OCSP	2016
6	**CIFF**	T/Abergele ,G/Afeshum, Alagie, Welkayt, T/Adyabo, Enderta, Hwuzen	**IYCF/CMAM** • ISS • Capacity building • Equipment procurement and support • Commodities • Social Behavior change communication and advocacy • Technical Mentor • PHC and HEW strengthen	December 2016
7	**WFP**	H/wejerat, T/Abergele, Erob, K/Tembien, Tselemti, Mereb Leke	Target supplementary feeding	December 2015
8	**REST**	R/azebo, K/awlaelo, Hawzen, w/leke, m/leke, Ahferom, Glomekeda, G/Afeshum, S/samre, D/tembien, T/abergele& K/Tembien	DFAP/Saftnet program/	Oct/2012-sep/2016
		R/azebo, e/mekoni, ofla & R/alamata K/humera	GRAD/livelihood activities/ LMD/Livestock marketing development	Sep/2012-oct/2016 Oct/12-sep/17
		R/azebo, K/awlaelo, Hawzen, w/leke, m/leke, Ahferom, Glomekeda, G/Afeshum, S/samre, D/tembien, T/abergele & K/Tembien	JEOP/joint emergency operational program	Aug/12-July/2016
9	**ORTHEDOX**	Enda mokoni, Atsbi wenberta, k/awulaelo, Adwa, S/Samre	Supplementary feeding capacity building IGA	November 2015

10	**CATHOLIC /CRC**	Ganta-Afeshum, Gulomekeda, T/tsa/Emba	IYCF /ENA	December 2016
11	**Word vision**	Raya alamata, S/samre, Enderta, K/awulaelo	Emergency nutrition	
12	**Save the Chil-dren**	Ofla, R/Azebo	Emergency nutrition	
13	**MI**	All woredas	Capacity building Technical support support material and Finance follow up CHD transition RHD Activities	June 2015
14	**Goal Ethiopia**	H/wejerat, hawuzen, Ahferom,	Emergency Nutrition	

B. Sampling

Table 33 Sampling procedure

Woreda	Kebelle	Kushet/ village	Total population	Cumulative population	Households		Mean number of study area	5039
Kola Tembien	Selam	Slawa	1584	1584			Random number for	
		K/Mhiret	2067	3651	24		cluster 1	3406
		Wukro	1512	5163			2	8445
		May-Gundi	1800	6963	24		3	13484
	Tabote Tigris	Limeat	2081	9044			4	18523
		Adi-Kawi	1446	10490			5	23562
		Simret	2079	12569			6	28601
		Chemrero	1080	13649	23		7	33640
	Merere	Merere	1690	15339			8	38679
		Azera	1815	17154			9	43718
		Guroro	1224	18378			10	48757
		Chimate	2460	20838	24		11	53796
	Mengi	Adi-Shihat	1029	21867			12	58835
		Gibi	1184	23051			13	63874
		Kuasla	1386	24437	23	118	14	68913
		Adi-Tigray	1368	25805			15	73952
Laelay Adiabo	Fethi	Tsaeda-Midri	4180	29985	23		16	78991
		Derso	2580	32565			17	84030
	Hibret	Endamariam	1872	34437	22			
		Terer	4356	38793	23			
		Swudey	2262	41055				
	Adi Gedena	Adi-Gedena	3240	44295	22			
		Gulti	1947	46242				
		Adi-Chiendog	1880	48122				
	Adi-Abagie	Gudlo	1610	49732	22			
		Adi-Abeza	1279	51011				
		Sefero	1920	52931				
		Tel-Teleko	941	53872	22			
		Kultur	2218	56090		134		
Ganta-Afeshum	Hagere-Selam	Keshehat	1450	57540				
		Dendera	762	58302				
		May-Weyini	1258	59560	24			
		M/Wgebet	1810	61370				
	Hadnet	Seta	2630	64000	25			
		Yaebo	1372	65372				
		Enfo	1336	66708				
		D/Mear	1682	68390				
	Bahra-Siheta	Tsenkakat	1253	69643	24			
		Adi-Amhara	1218	70861				
		May/Weyni	2112	72973				
		Bahra	1728	74701	25			
	Guahgot	Guahgot	1650	76351				
		Beteyesus	1416	77767				
		D/Mingas	1415	79182	25			
	Mugulat	Dkonoia	2467	81649				
		Atebes	2130	83779				
		Mekodie	1884	85663	25	148		
					400	400		

Green boxes indicate the two villages which were not originally sampled, but replaced sampled villages due to logistic constraint and safety issues (unsafe pathways to reach village). Chemrero was replaced by Merere and Mekodie by Dkonioa.

C. Training Agenda of NBS Enumerator Training

SEWOH Enumerator Training Mekelle, Ethiopia
Agenda
SEWOH Baseline Survey
11.01.2016 – 15.01.2016

Monday 11.01.2016	**Topic**	**Tools**	**Responsible**
09:00 – 09:30	Opening remarks and overview of SEWOH Introduction of survey team and enumerators Icebreaker	enumerator bag name tags/markers blank paper flipchart, pens	SN, AMB, CL
09:30 – 09:45	Overview of Training Activities/Workshop Agenda	handouts	CL
09:45 – 10:15	Training objectives, expectations and ground rules for workshop	flipchart paper/ pencils PPT 1	AMB, CL
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 2+3 presentation/ flipchart paper/ pencils	CL
10:45 – 11:00	*Coffee/Tea break*		
11:00 – 12:30	Review & translation of questionnaire Questions and answers to the questionnaire	Questionnaires, Projector, PPT 4	CL, AMB, HH
12:30 - 13:30	Lunch break		
13:30 – 15:00	Review & translation of questionnaire Questions and answers to the questionnaire	Questionnaires, Projector	CL, AMB, HH
15:00 – 15:15	*Coffee/Tea break*		
15:15 - 16:45	Review & translation of questionnaire Questions and answers to the questionnaire	Questionnaires, Projector	CL, AMB, HH
16:45 – 17:00	Wrap up of day, feedback	Flipchart paper markers	AMB
Tuesday 12.01.2016	**Topic**	**Tools**	**Responsible**
09:00 – 09:15	Briefing of day's agenda, group warm up,	Questionnaires, Projector	AMB
09:15 – 11:00	Review & translation of questionnaire Questions and answers to the questionnaire	Questionnaires, Projector	AMB,HH
11:00 – 11:15	*Coffee/Tea break*		
11:15 – 12:30	Review of questionnaire field guide	Field guide, Projector	AMB, HH
12:30 - 13:30	*Lunch break*		

13:30 – 14:30	Main duties of an enumerator, how to approach people, how to obtain consent, how to conduct an interview Completing a questionnaire: what is important	Projector, Flipchart paper, markers PPT 5	CL
14:30 – 15:00	Practice questionnaire in pairs (excluding 24h-recalls)	Questionnaire	CL
15:00 – 15:15	*Coffee/Tea break*		
15:15 – 16:45	Child Dietary diversity and Women Dietary diversity – introduction to relevant food groups, identification of common local foods from each group	Flipchart paper Markers PPT 6	AMB
16:45 - 17:00	Wrap up of day – what did we learn? Feedback	Flipchart paper markers	CL

Wednesday 13.01.2016	**Topic**	**Tools**	**Responsible**
09:00 – 09:15	Briefing of day's agenda, group warm up, clarifying questions		CL
09:45 – 11:00	How to conduct 24h dietary recall: What is important? Presentation of some examples Women dietary diversity and Child Dietary diversity practice in small groups	24h-recall sheets, PPT 6	AMB, CL
11:00 – 11:15	*Coffee/Tea break*		
11:15– 11:30	Introduction to tablets	Tablets	CL
11:30 – 12:30	Practice of questionnaire in small groups using the tablets	Questionnaire, Tablets	CL
12:30 – 13:30	Lunch break		
13:30 – 15:30	Group discussion: Clarifying questions on questionnaire and other questions Finalizing the questionnaire guide for the field	projector, Questionnaire	CL
15:30 – 15:45	*Coffee/Tea break*		
15:45 – 16:45	Practice questionnaire in small groups using the tablets	Questionnaires, pens, Tablets	AMB, CL
16:45 – 17:00	Wrap up, Feedback	Flipchart paper Marker	CL
Thursday 14.01.2016	**Topic**	**Tools**	**Responsible**
07:30 – 15:00	Pre-Test in Mekelle	Questionnaires, Tablets	AMB, CL, HH
Friday 15.01.2016	**Topic**	**Tools**	**Responsible**
10:30 – 12:30	Lessons Learned Discussion of experience during the pre-test, follow-up on challenges.		AMB, CL
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		

D. Nutrition Baseline Survey Interview Guide -Ethiopia

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:

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".

E. 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 1 0

Other Comments/Plan of Action for Making Improvements:

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

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

	Overall n=398	Kola Tembien n=118	Laelay Adiabo n=132	Ganta Afeshum n=148
Mean	2.4	2.3	2.3	2.5
SD	1.3	1.4	1.3	1.3
Md	3.0	2.5	2.0	3.0
Min	0	0	0	0
Max	6	6	6	6

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

	Overall n=273	Kola Tembien n=112	Laelay Adiabo n=123	Ganta Afeshum vn=138
Mean	2.4	2.3	2.3	2.5
SD	1.3	1.5	1.3	1.3
Md	3.0	2.0	2.0	3.0
Min	0	0	0	0
Max	6	6	5	6

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

	Overall n=25	Kola Tembien n=6	Laelay Adiabo n=9	Ganta Afeshum n=10
Mean	3.0	2.8	3.2	3.0
SD	1.0	0.4	1.5	0.8
Md	3.0	3.0	3.0	3.0
Min	1	2	1	2
Max	6	3	6	4

I. Feeding Frequency – children 6-23 months

	Overall n=398	Kola Tembien n=118	Laelay Adiabo n=132	Ganta Afeshum n=148
Mean	2.7	2.8	2.7	2.6
SD	1.3	1.4	1.3	1.2
Md	3.0	3.0	3.0	3.0
Min	0	0	0	0
Max	7	7	6	5

J. Questionnaire

Date: _____

Name of Mother/ Caregiver: _____

Name of Child: _____

ID Interviewer 1 ___, ID Interviewer 2 ___,

1	What is the birth date of your child (include name of child)? *(If she does not know, ask the mother to show you the birth card/vaccination card and record the birthdate from it)*		BIRTHDAT	Day Month Year
2	What is your age in years?		AGEMO	
If the child was born before 15th of February 2006 or after 15th July 2007 or if the mother is not between 15 to 49 years, thank the mother for her time and end interview. If the mother is not available, try to make an appointment later that day.				
Socioeconomic and agricultural information				
3	What is your marital status?	1= married 2= widowed 3= divorced or separated 4= single	MARSTAT	
3a	What is your religion	1= Christian 2= Islam 99= other (no specification needed)	RELIGION	
4	What is the sex of the household head?	1= male 2= female	HEADHH	
5	How many people live **permanently** in your household?	Record total number	HHMEMNO	
6	Are you able to read and write?	**0= no, 1= yes,**	RANDW	
6a	What is the highest class you completed at school? (if no school, write 88)	*Record number of years of schooling*	EDUCYEAR	
7	What are the sources of income of your household throughout the year? Check all that applies!			**0= no, 1= yes, 88= don't know**
	sale of own produced grains or vegetables/fruits (market sale)		INCCROP	
	sale own produced animal products		INCANIMA	
	sale of own produced or gathered goods/crafts		INCGOOD	
	casual labour/temporary salary (daily wages)		INCTEMP	
	petty trade / small business (mini shops, local drinks)		INCBUISN	
	employment/ regular salary		INCSALAR	
	remittances from relatives/husband		INCREMITT	
	Income generated by sale or exchange of public transfers (cash for work, food for work, food vouchers, fertilizer or seed vouchers etc.)		INCPUBTR	
	renting farm land to others		INCRENTF	
	subsistence farming only		INCSUBS	
	Other:		INCSPEC	
8	Does any member of this household has access to any land that can be used for agriculture?	***0= no → Q 10*** ***1= yes***	HHLAND	
9	Which crops did you grow on the land the past two years? ***Check all that applies***			***0= no, 1= yes, 88= don't know***
	Maize		MAIZE	
	Teff		TEFF	
	Wheat		WHEAT	
	Barley		BARLEY	
	Haflet		HAFLET	
	Sorghum		SORGHUM	
	Finger millet		FMILLET	
	Cassava		CASSAVA	

	Irish potato		WSPOT	
	Orange fleshed sweet potato		OSPOT	
	Legumes (beans, peas, lentils)		LEGUMES	
	Fenugreek		FENGU	
	Sunflowers		SUNFLOW	
	Safflower		SAFFFLOW	
	Sesame		SESAME	
	Noug		NOUG	
	Other, specify:		GROSPEC	
10	Do you have a home garden?	0= no → **Q 11a,** 1= yes	HOMEGAR	
11	Do you grow vegetables in your home garden?	0= no → ***Q 11a*** 1= yes, but only during the rainy season 2= yes, but only during the dry season 3= yes, year-round	GROVEG	
11a	11a) Do you grow vegetables anywhere else outside a home garden or are vegetables accessible (rent and share) to you? (not buying at the market)	0= no → **if no in Q11 and no in Q11a → 12** 1= yes, on irrigated land 2= yes, on rain-fed land	GRVEGWH	
11b	What kind of vegetables do you grow or are accessible to you (rent and share)? (home garden or outside of home garden) not buying at the market	***If yes in either Q 11 or 11a***		***0= no, 1= yes, 88= don't know***
	Tomatoes		VTOMATO	
	Onions		VONION	
	Carrots		VCARROT	
	Lettuce/Swiss chard		VLETTSC	
	Cabbage		VCABBAGE	
	Green pepper		VGREENP	
	Beet root		VBEETR	
	Garlic		VGARL	
	Other, specify:		VSPEC	
11c	What is the main use of vegetable produce?	1= mainly own consumption 2= mainly for sale 3= both (in approx. equal amounts) 99= other, specify:	USEVEG	
11d	Do you store your grown vegetable?	0= no → 11g, 1= yes, 88= don't know	STOREVEG	
11e	Do you face any problems with storage of grown vegetables?	0= no → Q 11g 1= yes, 88= don't know	STOREPRO	
11f	What kind of problems?			***0= no, 1= yes, 88= don't know***
	Humidity		HUMID	
	Rats/animals		RATS	
	Insects		INSECT	
	Lack of space		SPACE	
	Other, specify:		PROBOTH	
11g	Do you process any of your grown vegetable?	*0= no, → **Q 11i,** 1= yes, 88= don't know*	VPROCES	
11h	If yes, how do you process?			***0= no, 1= yes, 88= don't know***
	Drying		DRYING	
	Fermentation		FERMEN	
	Others, specify:		PROCOTH	

11i	Do you experience any major post-harvest losses on vegetable crops?	*0= no, Q → 12* *1= yes,* *88= don't know*	LOSHARV	
11j	If yes, on which major vegetable crop?			***0= no, 1= yes, 88= don't know,***
	Tomato		LTOMATO	
	Onion		LONION	
	Carrots		LCARROTS	
	Garlic		LGARLIC	
	Cabbage		LCABBAGE	
	Lettuce/ Swiss chard		LLETTUCE	
	Green pepper		LGREEN	
	Other specify		LOTHER	
11k	If yes, what do you do?			***0= no, 1= yes,***
	Nothing		STRNO	
	Crop spacing		STRCS	
	Use of chemicals		STRCH	
	Other, specify		STOTHER	
12	Do you have any fruit or fruit trees at your homestead or accessible (rent and share) to you and your family? (not buying at the market)	**0= no → *Q 13*** **1= yes**	GARFRUIT	
12a	What kind of fruit or fruit trees do you grow or are accessible/are shared with you?			***0= no, 1= yes, 88= don't know***
	Mango		FMANGO	
	Citrus		FCITRUS	
	Guava		FGUAVA	
	Papaya		FPAPAYA	
	Banana		FBANANA	
	Avocado		FAVOCAD	
	Beles (cactus fig)		BELES	
	Apple		FAPPLE	
	Peach		FPEACH	
	Other, specify:		FSPEC	
12b	Main use of fruits	1= mainly own consumption 2= mainly for sale 3= both (in approx. equal amounts) 99= other, specify:	USEFRU	
13	Do you use any fertilizer, herbicides, or pesticides?	***0= no, → Q14, 1= yes, 88= don't know***	USEPEST	
13a	What kind of fertilizer, herbicides, or pesticides do you use?			***0= no, 1= yes, 88= don't know***
	Urea		UREA	
	DAP		DAP	
	Compost		COMPOST	
	Round up		ROUNUP	
	2-4,d		TWOFOUR	
	Other, specify			
14	Does this household own any livestock herds, or poultry?	**0= no → *Q 16*** **1= yes**	ANIMALS	

14a	What kind of animals do you keep?		0= no, 1= yes, 88= don't know	
	Shoat (sheep and goat)		SHOAT	
	Cattle		CATTLE	
	Poultry		POULTRY	
15	Main use of animal produce? (meat, milk, eggs, etc.)	1= mainly own consumption 2= mainly for sale 3= both (in approx. equal amounts) 99= other, specify:	USEANIM	
16	How often do you (the mother) you consume eggs? (when it is no fasting season)	1= I do not eat any eggs 2= every other day 3= at least once per week 4= less than once per week	CONEGGS	
16a	Do you conduct fasting?	0= no 1= yes, sometimes 2= yes, every time	FASTING	
17	Do you or others in your household participate in programs such as….***Check all that applies***		0= no, 1= yes	
	school feeding		SCHOOLF	
	agricultural development		AGRDEV	
	cash transfer (cash/food for work)		CASHTRA	
	food aid		FOODAID	
	Other, specify:		SUPPSPEC	

Sanitation and hygiene information

18	What is the main source of drinking water for members of your household during the rainy season?	1= public tap/standpipe, borehole, protected hand dug well, rainwater collection, protected spring 2= unprotected spring, surface water (river, stream, dam, pond, canal, irrigation channel)	DRINKWAW	
19	What is the main source of drinking water for members of your household during the dry season?	1= public tap/standpipe, borehole, protected hand dug well, rainwater collection 2= unprotected spring, surface water (river, stream, dam, pond, canal, irrigation channel)	DRINKWAD	
20	Could you describe how you store water in your household?	1= clean container or jar 2= covered container 3= clean and covered container or jar 88= don't know 99= other, specify:	STOREWA	
21	What is the quality of your drinking water?	1= good 2= bad 88= don't know	DRINKQU	
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	
22a	What do you usually do to the water to make it safer to drink?	1= boil it 2= add moringa 3= strain it through a cloth 4= use a water filter (ceramic, sand, composite, etc.) 5= let it stand and settle 6= add wuha agar 7= add ash 88= don't know 99= other, specify:	TREATWA2	
23	How far do you have to go to get your drinking water? Round-way	1= near (<30 min) 2= moderate (30 min – 1hour) 3= far (> 1 hour) 99= other, specify:	DRINKDIS	
24	Do you have any access to unclean water nearby your house?	**0= no 1= yes 88= don't know**	ACCUNWA	
25	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 3= open defecation	LATRINE	
25a	Do you wash your hands after defecation?	0= no 1= yes, with soap or ash	TOILSOAP	

		2= yes, but no soap or ash		
26	***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	
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	
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	
d	You or anyone else in your household had to **skip a meal** because of a **lack of money or other resources**?	0= no 1= yes 88 = don't know 98= refused/no answer	HFIESD	
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	
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	
g	You or anyone else in your household **were hungry but did not eat** because of a **lack of money or other resources**?	0= no → ***Qi*** 1= yes 88 = don't know → ***Qi*** 98= refused/no answer	HFIESG	
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 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? ***Note:*** *If respondent says this did not happen in the last MONTH, go back to Qg 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	
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 →***Q27*** 1= yes 88 = don't know → ***Q27*** 98= refused/no answer	HFIESI	
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? ***Note:*** *If respondent says this did not happen in the last MONTH, go back to Qi 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	HFIESJ	
	Child information			
27	Is your child a boy or a girl?	1 = male 2 = female	SEXCHILD	
	Information on breastfeeding			
28	Has (name of child) ever been breastfed?	0= no 1= yes 88= don't know	IBFQ10	
28a	What did you give your child right after giving birth?	1 = breast milk 2= water 3= water and sugar 4= milk from animal 5= butter 88= don't know 99= other, specify:	BFAFTERB	
29	Was (name of the child) breastfed yesterday during day or at night?	0= no 1= yes 88= don't know	IYCFQ7	

29a	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	

Information on childcare

30	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, specify:	CARESUP	
30a	Who was taking care of (name of child) yesterday?	0= respondent 1= supporter	CAREYES	

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

31	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….. *Read each item aloud and record response before proceeding to the next item.*		**0= no, 1= yes, 88= don't know**
	Infant formula?	IYCFQ10B	
	If yes, how many times	IYCFQ11B	
	Tinned, powdered, fresh or packed milk?	IYCFQ10C	
	If yes, how many times	IYCFQ11C	
	Yoghurt?	IYCFQ10F	
	If yes, how many times	IYCFQ11C	

ANNEX: 24 H RECALL CHILDREN

31b	Did (name of child) receive anything to eat/any kind of food yesterday?	0= no → ***Q 34*** 1= yes 88= don't know → ***Q 34***	IYCFQ13	
32	How many times did (name of child) receive food including **meals** and **snacks** yesterday?	**Record number of times** 88= don't know	IYCFQ14	

Feeding Habits

33	Was (name of child)'s intake of food yesterday different from usual	0= no → ***Q34*** 1= yes, 88= don't know	CFUSUAL	
33a	If yes, why was it different?	1= child was sick 2= celebration 99= other, specify:	CFUSUALD	
34	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	
35	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	
35a	Please tell me some ways to make porridge more nutritious or better for your baby's health. *Probe if necessary:* Which foods or types of food can be added to 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	
	Pulses and nuts: flours of groundnut and other legumes (peas, beans, lentils, etc.), sunflower seed or other seeds		ADPULS	
	Orange (vitamin A rich) fruits and vegetables (carrot, orange-fleshed sweet potato, yellow pumpkin, mango, papaya, etc.)		ADVITA	
	Green leafy vegetables (e.g. spinach)		ADLVEG	
	Energy-rich foods (e.g. oil, butter, margarine)		ADFAT	
36	When (name of child) is sick, which includes having diarrhea, is he/she given less than usual, about the same amount, more than usual or nothing **to drink** (**including breast milk**)? *If less, PROBE: Was he/she given much less than usual* ***to drink*** *or somewhat less?*	1= much less 2= somewhat less 3= about the same 4= more 5= nothing 6= child never been sick 88= don't know	ILLDRINK	

37	When (name of child) is sick, which includes having diarrhea, is he/she given less than usual, about the same amount, more than usual or **nothing to eat**? *If less, PROBE: Was he/she given much less than usual **to eat** or somewhat less?*	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	
38	Has (name of child) had diarrhea in the past two weeks?	**0= no** **1= yes** **88= don't know**	CHDIAR	
39	Since (name of child) was born, how many times did he/she suffer from diarrhea?	*Record number of diarrhea episodes* *88= don't know*	FREQDIA	
40	How can you recognize that someone is not having enough food? *Probe if necessary:* 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	
	Weakness of the immune system (becomes ill easily or becomes seriously ill)		RECMAL2	
	Loss of weight/thinness		RECMAL3	
	Children do not grow as they should (growth faltering)		RECMAL4	
41	What are the reasons why people are malnourished? ***Do not read the answers, Check all that applies***		**0= no, 1= yes**	
	Not getting enough food		REAMAL1	
	Food is watery, does not contain enough nutrients		REAMAL2	
	Disease/ill and not eating food		REAMAL3	
42	What should we do to prevent malnutrition among young children (6–23 months) ***Do not read the answers, Check all that applies***		**0= no, 1= yes**	
	Give more food		PRVMAL1	
	Give different types of food each day		PRVMAL2	
	Feed frequently		PRVMAL3	
	Give attention during meals		PRVMAL4	
	Go to the health centre/hospital and check that the child is growing (growth monitoring services)		PRVMAL5	
43	Do you have a counseling structure for nutrition in your village?		**0= no, 1= yes, 88= don't know**	
	Health extension worker		COUNHEW	
	Volunteer group (women development army)		COUNVG	
	Agricultural extension service (development agents)		COUNAES	
	Others, specify:		COUNOTHE	
44	Did you receive any nutrition counseling?		**0= no, 1= yes, 88= don't know**	
	Health extension worker		NCHEW	
	Volunteer group (women development army)		NCVG	
	Agricultural extension service (development agents)		NCAES	
	Others, specify:		NCOTHER	
44a	Did you participate in any cooking demonstration?	**0= no, → Q 45** **1= yes**	CODEMON	
44b	Do you think it helped you to improve both your knowledge and feeding practices	0= No 1= Yes, just the knowledge 2= Yes, just the practice 3= Yes, both	IKDEMON	
45	How many times did you receive antenatal care during the pregnancy with (name of child)?	Record number of times 88= don't know	ANTECAR	
46	How many times did you go to under 5 clinic/health posts/ health center with (name of child)?	Record number of times 88= don't know	UNDER5	
47	Does your HH have soap (or washing powder/ liquid) at present? *Ask her to show you the soap.*	**0= no** **1= yes , 88= don't know**	HHSOAP	

	Washing hands before feeding child		WBEFFED	
	Washing hands before preparing food		WBEFFOOD	
	Washing hands before eating		WBEFEAT	
	Washing body, hair, clothes, dishes and pots, cleaning the house		WBODY	
48a	Please describe step by step how you wash your hands *Note:* ***do not read out the answers***	1= washes hands in **a bowl of water (sharing with other people)** 2= with someone pouring **a little clean water from a jug** onto one's hands 3= under **running water** 1= washes hands with soap or ashes 2= other (no need to specify)	HANDWA1 HANDWA2	
49	Food poisoning often results from contact with germs from faeces. What can you do to avoid sickness from germs from human or animal faeces? **Do not read the answers, check all that apply.**		**0= no , 1= yes**	
	Wash hands (after going to the toilet and cleaning the baby's bottom)		PRVDIA1	
	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	
	Cover food to protect it from flies		PRVDIA3	
	Wash fruit and vegetables before preparation		PRVDIA4	
	Reheat leftovers thoroughly before eating		PRVDIA5	
50	Did you ever receive any hygiene counseling?	**0= no** **1= yes** **88= don't know**	HWCOUN	
51	ANNEX 24 h recall for women			
52	Did you fast yesterday or was your food intake different from usual yesterday?	0= no 1= yes, fasting day 2= yes, different from usual	FIUSUAL	
52a	Why was it unusual?	1= sick 2= celebration 99= other, specify	FIUNSUAL	

Thank the mother for her time and cooperation.

24 h recall: Date:	Child's name:	HH:
Village:	Enum. ID 1:	Enum. ID 2:

First food after waking up	
Anything else?	
Anything else?	
Anything else?	
Anything else?	
Anything else?	
Anything else?	
Cereals: injera (red or white teff, wheat, sorghum, finger millet), maize, porridge (red or white teff, wheat, sorghum, finger millet), clear gruel (made out of grain) bread/kita, besso (barley flour drink), spaghetti, or other foods made from any grains like sorghum, millet, rice, wheat, oats, corn-flakes,	
Orange maize	
White roots and tubers: White sweet potatoes, Irish potatoes, potatoes, cassava, or any other foods made from roots, white pumpkin	
Orange fleshed roots/tubers or vegetables: yellow pumpkin, butternut, squash, carrots, or orange fleshed sweet potatoes	
Orange fleshed fruits: mangoes, apple mangoes, papayas	
Green leafy vegetables: Any dark green or medium-dark green leafy vegetables including wild green vegetables like cassava leaves, amaranth leaves, bean leaves, mustard, Swiss chard, hamli-adri (rape leaves)	
Other fruit and vegetables: oranges, lemons, tangerines, bananas, avocado, guava, apple, watermelon, grapes, strawberry, beles, other fruits; cabbage, eggplants, tomatoes, onions, green pepper, cucumber, mushrooms, lettuce, beet root	
Organ meat: Liver, kidney, blood-based foods, or other organ meats (incl. from wild game)	
Flesh meat: Any meat, meat powder, such as beef, lamb (young sheep, sheep), mutton, goat, chicken, rabbits, small birds, wild game meat or sausage	
Fish: Fresh or dried fish, shellfish, or seafood	
Eggs: Eggs	
Milk and milk-products: Milk (fresh or powder), cheese, yoghurt or other milk products (ice cream)	
Pulses, nuts and seeds: mature beans or peas (fresh or dried), lentils, cowpeas, fava beans, chickpeas, fieldpeas, grasspeas, guya, groundnuts (groundnut flour), plumpy nut, peanut-butter, pumpkin seeds, sunflower seeds, noug seeds, safflower, sesame, flax	
Oils/Fats: Oil, fats or butter added to food or used for cooking, including extracted oils from nuts, fruits and seeds, and all animal fat	
Sugar and sweets: Any sugary foods such as chocolates, sugar, sugar cane, honey, sweets, candies, cakes, or biscuits, jam, sweetened fruit juice or juice-drinks, soft drinks/sodas like, fanta, cocacola, sprite, mirinda, etc., chocolat drinks, tea with sugar	
Condiments: Ingredients used in small amounts for flavor, such as chilies, pepper, ginger, spices, herbs, garlic, fish powder, salt, tomato-paste, flavor cubs	

24h recall: Date:	Mothers's name:	HH:
Village:	Enum. ID 1:	Enum. ID 2:

First food after waking up		
Anything else?		
Anything else?		
Anything else?		
Anything else?		
Anything else?		
Anything else?		
Consider quantities!!!!! Minimum 15g = 1 Tablespoon	**Cereals:** injera (red or white teff, wheat, sorghum, finger millet), maize, porridge (red or white teff, wheat, sorghum, finger millet), bread/kita, besso (barley flour drink), spaghetti, or other foods made from grains like sorghum, millet, rice, wheat, oats, corn-flakes	
	Orange maize	
	White roots and tubers: White sweet potatoes, Irish potatoes, potatoes, cassava, or any other foods made from roots	
	Orange roots/tubers or vegetables: Pumpkin, butternut, squash, carrots, or sweet potatoes that are yellow or orange inside	
	Orange fleshed fruits: mangoes, apple mangoes, papaya	
	Green leafy vegetables: Any dark green or medium-dark green leafy vegetables including wild green vegetables like cassava leaves, amaranth leaves, bean leaves, mustard, Swiss chard, hamli-adri (rape)	
	Other fruits: oranges, lemons, tangerines, bananas, avocado, guava, apple, watermelon, grapes, strawberry, beles, other fruits:	
	Other vegetables: cabbage, eggplants, tomatoes, onions, green pepper, cucumber, mushrooms, lettuce, beet root	
	Organ meat: Liver, kidney, blood-based foods, or other organ meats (including from wild game)	
	Flesh meat: Any meat, such as beef, lamb (young sheep, sheep), mutton, goat, chicken, rabbits, small birds, wild game meat or sausage	
	Fish: Fresh or dried fish, shellfish, or seafood	
	Eggs: Eggs	
	Milk and milk-products: Milk (fresh or powder), cheese, yoghurt or other milk products	
	Pulses: mature beans or peas (fresh or dried), lentils, cowpeas, fava beans, chickpeas, fieldpeas, grasspeas, guya	
	Nuts and seeds: groundnuts (groundnut flour), peanut-butter, pumpkin seeds, sunflower seeds, noug seeds, safflower, sesame, flax,	
	Oils/Fats: Oil, fats or butter added to food or used for cooking, including extracted oils from nuts, fruits and seeds, and all animal fat	
	Fried snacks: Crisps and chips, fried grain (kollo), fried potatoes, fried dough (doughnuts, fritters), other fried snacks	
	Sugar and sugary foods: chocolates, sugar, sugar cane, honey, sweets, candies, cakes, or biscuits, ice cream	
	Sweet drinks or alcoholic beverages: Sweetened fruit juice or juice-drinks, soft drinks/fizzy drinks like, fanta, coca-cola, sprite, tea or coffee with sugar, swa (cereal based local brew), mes (honey based wine)	
	Condiments: Ingredients used in small amounts for flavor, such as chillies, pepper, ginger, spices, herbs, garlic, salt, fenugreek, tomato-paste, flavor cubs	

K. Results disaggregated by TAs

The following table presents the answers to the questions following the questionnaire. The answers are disaggregated into the three woredas, Kola Tembien, Laelay Adiabo, and Ganta Afeshum.

Ethiopia, Tigray Region	Overall	Kola Tembien	Laelay Adiabo	Ganta Afeshum
	n=398	**n=118**	**n=132**	**n=148**
1. Age of child	**13.2±5.1**	**12.2±4.7**	**13.4±5.4**	**13.8±5.0**
2. Age of women (mothers): (mean ± SD)	**28.7±6.7**	**27.7±6.5**	**27.6±5.9**	**30.5±7.2**
3. Marital status (%)				
Married	91.5	92.4	91.7	90.5
Widowed	0.3	0.8	0.0	0.0
Divorced or separated	7.0	5.1	8.3	7.4
Single	1.3	1.7	0.0	2.0
3a. What is your religion?				
Christian	99.5	99.2	99.2	100
Other	0.5	0.8	0.8	0.0
4. Household head (%)				
Male	81.4	73.7	84.8	84.5
Female	18.6	26.3	15.2	15.5
5. How many people live permanently in your household? (mean±SD)	**5.6±1.9**	**5.3±1.9**	**5.6±1.9**	**5.9±1.9**
6. Literacy rate (able to read and write) (%)	**43.7**	**42.4**	**32.6**	**54.7**
6a. Received education (%)	**44.5**	**43.2**	**34.1**	**56.1**
	n=176	**n=51**	**n=44**	**n=83**
6b. Number of school years (mean±SD) (n=176)	**5.8±2.8**	**5.9±2.9**	**5.0±2.7**	**6.2±2.8**
7. Sources of income (%)	**n=398**	**n=118**	**n=132**	**n=148**
Sale of own produced crops	57.5	44.9	72.7	54.1
Sale of own animal or produced animal products	56.5	58.5	49.2	61.5
Sale of own produced or gathered goods	6.0	9.3	6.1	3.4
Casual labour/temporary salary	45.2	65.3	41.7	32.4
Small business	14.8	22.9	11.4	11.5
Employment/ regular salary	5.0	2.5	4.5	7.4
Remittances from relatives/husband	9.5	7.6	8.3	12.2
Income generated by sale or exchange of public transfers	38.7	29.7	10.6	70.9
Renting farm land	4.8	5.9	5.3	3.4
Mining	4.5	0.8	12.9	0.0
Subsistence farming	2.3	3.4	3.0	0.7
Income sources diversity_Incscore (mean±SD (Min-Max)) (n=395)	2.4±1.0 (0-5)	2.5±1.1 (0-5)	2.2±1.0 (0-5)	2.6±0.9 (0-4)
8. Access to land that can be used for agriculture (%)	**n=398**	**n=118**	**n=132**	**n=148**

No	5.3	5.9	3.0	6.8
Yes	94.7	94.1	97.0	93.2

Ethiopia, Tigray Region	Overall	Kola Tembien	Laelay Adiabo	Ganta Afeshum
9. Crops grown by household on land in the past one year (%)	**n=377**	**n=111**	**n=128**	**n=138**
Maize	69.8	90.1	89.1	35.3
Teff	60.5	83.8	92.2	12.3
Wheat	38.2	7.2	0.8	97.8
Barley	49.9	55.9	7.0	84.8
Haflet	9.3	2.7	0.8	22.5
Sorghum	36.6	83.8	23.4	10.9
Finger millet	40.6	31.5	83.6	8.0
Irish potato	4.5	0.9	3.1	8.7
Orange fleshed sweet potato	0.3	0.0	0.0	0.7
Legumes	42.7	58.6	20.3	50.7
Fenugreek	10.6	11.7	1.6	18.1
Sunflower	4.8	12.6	2.3	0.7
Safflower	1.1	1.8	0.8	0.7
Sesame	6.4	15.3	3.9	1.4
Noug	9.8	27.0	5.5	0.0
Flax	6.0	11.9	2.3	4.7
Crop diversity (mean±SD (Min-Max)) (n=375)	3.9±1.9 (1-12)	4.9±2.2 (1-12)	3.4±1.2 (1-7)	3.6±1.7 (1-10)
10. Households have home gardens (%)	**n=398**	**n=118**	**n=132**	**n=148**
No	30.4	26.3	25.8	37.8
Yes	69.6	73.7	74.2	62.2
11. Grow vegetables in home garden (%)	**n=277**	**n=87**	**n=98**	**n=92**
No	38.6	35.6	25.5	55.4
Yes, but only during the wet season	55.2	60.9	69.4	34.8
Yes, but only during the dry season	0.4	0.0	0.0	1.1
Yes, year-round	5.8	3.4	5.1	8.7
11a. Grow vegetables in other place apart from home garden (%)	**n=398**	**n=118**	**n=132**	**n=148**
No	70.1	74.6	68.9	67.6
Yes, on irrigated land	15.6	11.0	6.8	27.0
Yes, on rain-fed land	14.3	14.4	24.2	5.4
11b. Kind of vegetables grown from home garden or outside of the home garden	**n=206**	**n=61**	**n=82**	**n=63**
Tomatoes	66.0	70.5	62.2	66.7
Onions	38.3	19.7	34.1	61.9
Carrots	4.9	6.6	2.4	6.3
Lettuce/Swiss chard	30.6	44.3	12.2	39.7
Cabbage	14.6	4.9	2.4	39.7
Green pepper	75.4	76.2	92.3	52.4

Beet root	4.4	1.6	4.9	6.3
Garlic	28.2	19.7	29.3	34.9
Pumpkin	0.3	0.0	0.8	0.0
Vegetable diversity score (mean±SD (Min-Max)	2.6±1.6 (1-8)	2.4±1.5 (1-6)	2.4±1.5 (1-8)	3.1±(1-8)

11c. Main use of vegetables produced/ grown (%)	**n=206**	**n=61**	**n=82**	**n=63**
Mainly for own consumption	74.3	77.0	90.2	50.8
Mainly for sale	21.8	21.3	7.3	41.3
Both (in approx, equal amounts)	3.9	1.6	2.4	7.9
11d. Storage of own grown vegetables	**n=206**	**n=61**	**n=82**	**n=63**
No	88.8	85.2	91.5	88.9
Yes	11.2	14.8	8.5	11.1
11e. Facing problems with storage	**n=23**	**n=9**	**n=7**	**n=7**
No	78.3 (n=18)	88.9 (n=8)	71.4 (n=5)	71.4 (n=5)
Yes, humidity	0.8 (n=3)	0.0 (n=0)	0.8 (n=1)	1.4 (n=2)
Yes, rats	0.0 (n=0)	0.0 (n=0)	0.0 (n=0)	0.0 (n=0)
Yes, Insects	0.3 (n=1)	0.0 (n=0)	0.8 (n=1)	0.0 (n=0)
Yes, lack of space	0.5 (n=2)	0.8 (n=1)	0.8 (n=1)	0.0 (n=0)
11g. Processing of vegetables	**n=206**	**n=61**	**n=82**	**n=63**
No	87.9	87.3	93.9	98.6
Yes, drying	12.1	12.7	6.1	1.4
Yes, fermentation	0.0	0.0	0.0	0.0
11i. Post-harvest losses	**n=206**	**n=61**	**n=82**	**n=63**
No	84.0	93.4	72.0	90.5
Yes	16.0	6.6	28.0	9.5
11j.Crop affected by post-harvest loss	**n=33**	**n=4**	**n=23**	**n=6**
Tomatoes	39.4	0.0	39.1	66.7
Onions	12.1	0.0	8.7	33.3
Carrots	0.0	0.0	0.0	0.0
Garlic	3.0	0.0	4.3	0.0
Cabbage	6.1	0.0	4.3	16.7
Lettuce/Swiss chard	9.1	25.0	8.7	0.0
Green pepper	60.6	50.0	69.6	33.3
Other	0.0	0.0	0.0	0.0
11k. Copying mechanisms	**n=33**	**n=4**	**n=23**	**n=6**
None	51.5	100	34.8	83.3
Crops spacing	30.3	0.0	39.1	16.7
Use of chemicals	18.2	0.0	26.1	0.0
Other	0.0	0.0	0.0	0.0
12. Household grows or has access to fruit trees (%)	**n=398**	**n=118**	**n=132**	**n=148**
No	73.6	81.4	85.6	56.8
Yes	26.4	18.6	14.4	43.2

12a. Kind of fruits grown or fruit trees accessible to family	**n=105**	**n=22**	**n=19**	**n=64**
Mango	19.0	68.5	21.1	1.6
Citrus	18.1	36.4	47.4	3.1
Guava	**20.0**	**4.5**	**47.4**	**17.2**
Papaya	9.5	27.3	21.1	0.0
Banana	4.8	13.5	5.3	1.6
Avocado	5.7	9.1	5.3	4.7
Beles (cactus fig)	56.2	4.5	0.0	90.0
Apple	2.9	0.0	0.0	4.7
Peach	1.0	0.0	4.8	0.0
Fruit diversity score (mean±SD (Min-Max)	1.4±0.8 (1-4)	1.6±0.9 (1-4)	1.5±0.8 (1-4)	1.2±0.6 (1-4)
12b. Main use of fruits grown/ accessible to household (%)	**n=105**	**n=22**	**n=19**	**n=64**
Mainly for own consumption	64.0	25.0	57.1	80.3
Mainly for sale	22.5	54.2	14.3	13.6
Both (in approx, equal amounts)	5.4	4.2	9.5	4.5
Others (not yet ready for harvest)	8.1	16.7	19.0	1.5
13. Use of fertilizer	**n=377**	**n=111**	**n=128**	**n=138**
No	2.1	0.9	2.4	2.9
Yes	97.9	99.1	97.6	97.1
13a. Kind of fertilizer	n=369	n=114	n=109	n=142
Urea	94.9	99.1	87.1	98.5
DAP	97.3	93.6	97.6	100
Compost	78.5	90.8	61.0	84.6
Round-up	21.5	31.2	25.2	10.3
2-4,d	40.4	60.6	56.5	9.6
14. Household ownership/ rearing of animals (%)	**n=398**	**n=118**	**n=132**	**n=148**
No	5.8	5.1	5.3	6.8
Yes	94.2	94.9	94.7	93.2
14a. Type of animals reared by household (%)	**n=375**	**n=112**	**n=125**	**n=138**
Goat and or sheep	65.2	68.8	45.6	79.9
Cattle	84.8	89.3	83.2	82.7
Poultry	84.8	87.5	89.6	78.4
15. Main use of animals reared (%)	**n=375**	**n=112**	**n=125**	**n=138**
Mainly for own production	77.0	40.2	67.2	58.7
Mainly for sale	21.3	37.5	9.6	17.4
Both (in approx, equal amounts)	1.6	22.3	19.2	23.9
Other	1.3	0.0	4.0	0.0
16. Consumption of eggs	**n=398**	**n=118**	**n=132**	**n=148**
Do not eat any eggs	12.6	11.0	12.1	14.2
Every other day	8.3	6.8	6.8	10.8
At least once a week	46.5	53.4	49.2	38.5

less than once per month	32.5	28.8	31.8	36.5
16a. Conduction of fasting	**n=398**	**n=118**	**n=132**	**n=148**
Never	0.5	1.7	0.0	0.0
Yes, sometimes	13.1	11.0	12.2	15.5
Yes, every time	86.4	87.3	87.9	84.5
17. Respondent or any household member participate/ benefit from the following programs	**n=398**	**n=118**	**n=132**	**n=148**
School feeding	3.0	0.0	6.8	2.0
Agricultural development	55.0	54.2	45.5	64.2
Cash transfer	42.0	36.4	13.6	71.6
Food aid	20.6	17.8	14.4	28.4
18. Source of drinking water for household members during the rainy/wet season(%)	**n=398**	**n=118**	**n=132**	**n=148**
Piped water into dwelling, to yard or plot, public tap/ standpipe, tube well/ borehole, protected dug well, protected spring, rain water collection	81.9	94.1	89.4	65.5
Unprotected spring, unprotected dug well, surface water	18.1	5.9	10.6	34.5
19. Source of drinking water for household members during the dry/hot season (%)	**n=398**	**n=118**	**n=132**	**n=148**
Piped water into dwelling, to yard or plot, public tap/ standpipe, tubewell/ borehole, protected dug well, protected spring, rain water collection	82.2	94.9	84.9	69.6
Unprotected spring, unprotected dug well, surface water etc	17.8	5.1	15.1	30.4
20. Storage of drinking water in household (%)	**n=398**	**n=118**	**n=132**	**n=148**
Clean container or jar	15.8	13.6	159	17.6
Covered container	9.0	6.8	11.4	8.8
Clean and covered container or jar	74.9	79.7	72.0	73.6
Other (Specify)	0.3	0.0	0.8	0.0
21. Quality of drinking water (own perception)	**n=398**	**n=118**	**n=132**	**n=148**
Good	90.7	96.6	89.4	87.2
Bad	9.3	3.4	10.6	12.8
22. Do you do anything to your water before drinking? (%)	**n=398**	**n=118**	**n=132**	**n=148**
No	83.9	84.7	87.1	80.4
Yes	16.1	15.3	12.9	19.6
22a. What do you usually do to the drinking water? (%)	**n=64**	**n=18**	**n=17**	**n=29**
Boil it	26.6	22.2	5.9	41.4
Strain it through a cloth	56.3	50.0	64.7	55.2
Use a filter	4.7	11.1	5.9	0.0
Use solar disinfection	4.7	0.0	11.8	3.4
Let it stand and settle	7.8	16.7	11.8	0.0

23. Walking distance/ trek to get household water during the rain/ wet season (round trip): (%)	**n=398**	**n=118**	**n=132**	**n=148**
Near (<30 minutes)	65.8	66.9	64.4	66.2
Moderate (30- 1 hour)	26.1	31.4	29.5	18.9
Far (more than 1 hour)	8.0	1.7	6.1	14.9

24. Access to dirt water nearby homestead	**n=398**	**n=118**	**n=132**	**n=148**
No	68.1	72.0	56.8	75
Yes	31.9	28.0	43.2	25.0
25. Toilet facility	**n=398**	**n=118**	**n=132**	**n=148**
pit latrine with slab, composting toilet (improved)	**12.3**	**11.9**	**3.0**	**20.9**
pit latrine without slab, bucket (unimproved)	36.2	41.5	25.8	41.2
open defecation (unimproved)	51.5	46.6	71.2	37.8
25a. Washing hands after defecation	**n=398**	**n=118**	**n=132**	**n=148**
No	1.0	0.8	1.5	0.7
Yes, with soap	65.6	67.8	65.9	63.5
Yes, without soap	33.1	31.4	32.9	35.8
26. HFIES Questions	**n=398**	**n=118**	**n=132**	**n=148**
1. Worried not to have enough food	55.8	60.2	53.3	54.1
2. Unable to eat healthy and nutritious food	37.4	41.5	34.8	36.5
3. Ate only a few kinds of food	36.2	40.7	26.5	41.2
4. Skipped a meal	13.8	18.6	6.1	16.9
5. Ate less than should eat	21.1	34.7	13.6	16.9
6. Ran out of food	1.0	0.8	0.8	1.4
7. Were hungry but did not eat	5.8	11.9	2.3	4.1
8. Went without food for a whole day	0.8	1.7	0.8	0.0
26 cont. HFIES SCORE	**n=398**	**n=118**	**n=132**	**n=148**
Food secure	32.2	26.3	33.3	35.8
Mildly food insecure	48.7	46.6	56.1	43.9
Moderately food insecure	17.8	24.6	10.6	18.9
Severely food insecure	1.3	2.5	0.0	1.4
27. Sex of children	**n=398**	**n=118**	**n=132**	**n=148**
Male	49.0	47.3	52.3	47.3
Female	51.0	52.7	47.7	52.7
28. Has the child ever been breastfed?	**n=398**	**n=118**	**n=132**	**n=148**
no	1.3	0.8	1.5	1.4
yes	98.7	99.2	98.5	98.6
28a. What did you give your child immediately after birth?	**n=398**	**n=118**	**n=132**	**n=148**
Breast milk	97.0	98.3	96.2	96.6
water	0.0	0.0	0.0	0.0
water and sugar	0.3	0.0	0.0	0.7
milk from animal	0.0	0.0	0.0	0.0

ghee	0.8	0.0	2.3	0.0
dont know	1.0	0.8	0.8	1.4
other	1.0	0.8	0.8	1.4
29. Was your child breastfed yesterday during day or night?	**n=398**	**n=118**	**n=132**	**n=148**
No	6.8	5.1	8.3	6.8
Yes	93.2	94.9	91.7	93.2
29a. Did your child consume breast milk yesterday, by spoon…?	**n=398**	**n=118**	**n=132**	**n=148**
No	91.7	93.2	85.6	95.9
Yes	8.3	6.8	14.4	4.1
30. Who is supporting you in taking care of your child?	**n=398**	**n=118**	**n=132**	**n=148**
Respondent alone	34.7	32.2	35.6	35.8
mother/ mother-in-law	23.6	23.7	18.9	27.7
older siblings of child	36.9	34.7	41.7	34.5
other (mostly husband)	4.8	9.3	3.8	2.0
30a. Who was taking care of your child yesterday?	**n=398**	**n=118**	**n=132**	**n=148**
Respondent alone	84.4	84.7	84.1	84.5
supporter	15.6	15.3	15.9	15.5
35. Which porridge would you give to a young child?	**n=398**	**n=118**	**n=132**	**n=148**
thick porridge	47.0	41.5	50	48.6
watery porridge	52.3	58.5	48.5	50.7
don’t know	0.8	0.0	1.5	0.7
35a. Ways to make porridge more nutritious?	**n=398**	**n=118**	**n=132**	**n=148**
animal source foods (meat, poultry, fish, live/ organ meat, eggs, milk etc.)	47.7	46.4	46.2	50
pulses and nuts	46.5	44.1	39.4	54.7
orange fruits and vegetables	20.4	16.9	17.4	25.7
green leafy vegetables	24.4	23.7	23.5	25.7
energy-rich foods (e.g. butter, oil)	89.7	78.0	91.7	97.3
36. When the child is sick, is it given less than usual to DRINK?	**n=398**	**n=118**	**n=132**	**n=148**
much less	7.1	8.5	8.5	4.7
somewhat less	24.1	23.1	31.5	18.2
about the same	7.8	4.3	10.8	8.1
more	53.7	59.8	46.9	54.7
nothing	1.5	0.0	0.8	3.4
child never been sick	5.8	4.3	1.5	10.8
37. When the child is sick, is it given less than usual to EAT?	**n=398**	**n=118**	**n=132**	**n=148**
much less	7.1	8.5	6.9	6.1
somewhat less	19.1	20.5	23.8	15.5
about the same	8.3	5.3	11.5	7.4

more	53.0	55.9	50	53.4
nothing	1.8	0.0	2.3	2.7
child never been sick	4.8	2.5	1.5	9.5
child does not yet take food	5.3	6.8	3.8	5.4
38. Has the child had diarrhea in the past two weeks?	**n=398**	**n=118**	**n=132**	**n=148**
no	68.8	78.0	54.3	74.6
yes	31.2	22.0	44.7	26.4
39. Since the child was born, how many times has the child suffered from diarrhea?	**n=398**	**n=118**	**n=132**	**n=148**
Mean± SD (min-max)	1.8±1.7 (0-10)	1.9±1.9 (0-10)	2.3±1.4 (0-10)	1.4±1.4 (1-10)
40. Signs of malnutrition? How can you recognize that someone is not eating enough food?				
Lack of energy/weakness	66.3	65.3	66.7	66.9
Weakness of the immune system	64.3	61.9	62.9	67.6
loss weight/thinness	91.3	88.1	91.7	93.2
children do not grow as they should	31.7	22.9	37.1	33.8
41. Reasons/ What are the reasons why people are malnourished?	**n=398**	**n=118**	**n=132**	**n=148**
not getting enough food	95.2	95.8	93.2	96.6
food is watery, does not contain enough nutrients	51.8	44.9	54.5	54.7
disease and not eating food	50.5	42.4	59.1	49.3
42. What should we do to prevent malnutrition among young children (6-23 months)	**n=398**	**n=118**	**n=132**	**n=148**
give more food	75.4	83.1	75.8	68.9
give different types of food each day	88.9	83.9	89.4	92.6
feed frequently	68.6	66.9	65.2	73
give attention during meals	52.8	46.6	52.3	58.1
go to the health centre/ hospital and check that the child is growing	32.2	16.1	39.4	38.5
43. Do you have a counselling structure for nutrition in your village	**n=398**	**n=118**	**n=132**	**n=148**
no	10.1	14.4	11.4	5.4
health extention worker	86.9	79.7	85.6	93.9
volunteer group (mother to moher support group)	47.3	39.8	42.4	57.4
agricultural extention service (development agents)	10.3	13.6	6.8	10.8
44. Do you receive any nutrition counselling?	**n=398**	**n=118**	**n=132**	**n=148**
no	19.1	22.9	26.5	9.5
health extention worker/ CHVs	78.1	79.7	85.6	93.9
volunteer group (mother to moher support group)	36.9	39.8	42.4	57.4
agricultural extention service (development agnets)	5.3	13.6	6.8	10.8
45. Participation in cooking demonstration	**n=398**	**n=118**	**n=132**	**n=148**
no	66.1	77.5	72.0	54.1

yes	33.9	22.5	28.0	45.9
44a. Do you think it helped you to improve both your knowledge and feeding practices?	**n=135**	**n=30**	**n=37**	**n=68**
no	1.5	6.7	0.0	0.0
yes, just the knowledge	25.2	26.7	29.7	22.1
yes, just the practice	11.1	16.7	13.5	7.4
yes, both	62.2	50.0	56.8	70.6
45. How many times did you recieve antenatal care during the last pregnancy? Mean±SD (min-max)	**4.1±1.4 (0-10)**	**4.3±1.5 (0-8)**	**3.6±1.5 (0-10)**	**4.4±1.1 (2-8)**
46. How many times did you go to the under 5 clinic with your child? Mean±SD (min-max)	**4.2±1.1 (2-9)**	**4.0±1.1 (2-9)**	**4.1±1.0 (0-9)**	**4.6±1.2 (3-8)**
47. Does your household have soap (or washing powder/liquid) at present?	**n=398**	**n=118**	**n=132**	**n=148**
no	21.6	25.3	7.6	12.2
yes	88.4	84.7	92.4	87.8
48. When you used soap today or yesterday, what did you use it for?	**n=398**	**n=118**	**n=132**	**n=148**
washing my child's hands	60.8	64.4	58.3	60.1
washing hand after visiting the toilet (defecation)	56.8	55.1	58.3	56.8
washing hands after cleaning child (after child defecation)	36.9	36.4	36.4	37.8
washing hands before feeding child	38.4	39.0	34.8	41.2
washing hands before preparing food	45.7	50.8	40.9	45.9
washing hands before eating	40.5	43.2	37.9	40.5
washing body, hair, clothes, dishes and pots, cleaning the house	75.4	71.2	81.1	73.6
48a. How you wash hands?	**n=398**	**n=118**	**n=132**	**n=148**
in a bowl of water	20.4	38.1	11.4	14.1
a little clean water from a jug	78.6	61.0	87.1	85.1
under running water	1.0	0.8	1.5	0.7
	n=398	n=118	n=132	n=148
with soap or ashes	76.4	82.2	67.4	79.7
other	23.6	17.8	32.6	20.3
48. Did you receive any hygiene counselling?	**n=398**	**n=118**	**n=132**	**n=148**
no	11.6	16.9	16.7	2.7
yes	88.4	83.1	83.3	97.3
1. Age of children in months (mean±SD)	**13.2±5.1**	**12.2±4.7**	**13.4±5.4**	**13.8±5.0**
34. Age (months) when complemenary foods was introduced (mean±SD)	**6.4±1.5**	**6.2±1.2**	**6.6±1.8**	**6.4±1.5**
51. Dietary diversity of women aged 15-49 years	**n=398**	**n=118**	**n=132**	**n=148**
IDDS-W (mean± SD)	3.1±0.9	3.1±1.1	3.0±0.8	3.2±0.9
% of women who received foods from ≥ 5 food groups	6.8	7.6	4.5	8.1
52. Food intake different due to fasting or other occasions?	**n=398**	**n=118**	**n=132**	**n=148**

No	65.1	66.9	65.2	63.5
Yes, fasting	12.8	4.2	10.6	21.6
Yes, sick	0.8	0.8	1.5	0.0
Yes, celebration	21.1	28.0	22.0	14.9
Other	0.3	0.0	0.8	0.0
30. Dietary Diversity of Children aged 6-23 months: (n=398)	**n=398**	**n=118**	**n=132**	**n=148**
IDDS for children (mean± SD)	2.4±1.3	2.4±1.4	2.3±1.3	2.5±1.3
31. Minimum meal frequency (MMF)	**n=398**	**n=118**	**n=132**	**n=148**
All children	66.3	66.9	68.2	64.2
Breastfed	67.8	69.6	68.3	65.9
Non-breastfed	44.0	16.7	66.7	40.0
Minimum dietary diversity (MDD)	n=398	n=118	n=132	n=148
All children	19.3	20.3	14.4	23.0
Breastfed	19.3	21.4	13.8	22.5
Non-breastfed	20.0	0.0	22.2	30.0
Minimum acceptable diet (MAD)	n=398	n=118	n=132	n=148
All children	17.1	19.5	12.1	19.6
Breastfed	18.0	20.5	12.2	21.0
Non-Breastfed	4.0	0.0	11.1	0.0
33. Child's food intake different from usual	**n=398**	**n=118**	**n=132**	**n=148**
No	91.3	83.8	95.0	93.9
yes, was sick	2.5	3.4	1.5	2.7
yes, it was a celebration	4.8	9.3	3.0	2.7
don't know	0.5	2.7	0.0	0.0
Women (10 food groups, frequency)	n=398	n=118	n=132	n=148
Starchy staple food	100	100	100	100
Beans and peas	56.3	35.6	37.1	89.9
Nuts and seeds	0	0	0	0
Dairy products	12.1	13.6	11.5	11.5
Flesh foods	34.9	37.3	46.2	23
Eggs	12.6	23.7	7.6	8.1
Dark green leafy vegetable	1.5	0	1.5	2.7
Vitamin rich fruits and vegetables	1.8	5.1	0	0.7
Other vegetables	89.2	87.3	96.2	84.5
Other fruits	3.3	5.1	2.3	5.1
Number of different food groups consumed (women)	**n=398**	**n=118**	**n=132**	**n=148**
0	0.0	0.0	0.0	0.0
1	1.3	3.4	0.8	0.0
2	23.4	25.4	26.5	18.9
3	46.2	44.1	47.0	47.3
4	22.4	19.5	21.2	25.7
5	5.8	4.2	4.5	8.1

6	0.5	1.7	0.0	0.0
7	0.5	1.7	0.0	0.0
8	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0
Children (7 food groups, frequency)	**n=398**	**n=118**	**n=132**	**n=148**
Grains, roots and tubers	88.9	87.3	90.2	89.2
Legumes and nuts	38.7	25.4	23.5	62.8
Dairy products	19.1	19.5	22.7	15.5
Flesh foods	11.3	19.5	9.8	6.1
Eggs	23.6	24.6	26.5	20.3
Vitamin A-rich fruits/ vegetables	1.3	1.7	1.5	0.5
Other fruits/ vegetables	58.3	57.6	59.1	58.1
Number of different food groups consumed (children)	**n=398**	**n=118**	**n=132**	**n=148**
0	9.3	11.9	9.8	6.8
1	16.6	18.6	15.9	15.5
2	22.9	19.5	25.8	23
3	31.9	29.7	34.1	31.8
4	14.3	13.6	9.1	19.6
5	4.3	5.9	4.5	2.7
6	0.8	0.8	0.8	0.7
7	0.0	0.0	0.0	0.0

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