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# Nutrition Baseline Survey Kenya

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## Acronyms and Abbreviations

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

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# Introduction

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

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

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

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

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

Bonn, September 2016  
Michael Lossner

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# 1. EXECUTIVE SUMMARY

The Nutrition Baseline Survey (NBS) was conducted in Turkana and Marsabit Counties in Northern Kenya between January and February 2016. The NBS targeted households with women of reproductive age (15-49 years), and their children aged 6-23 months. The main objective of the NBS was to describe the food and nutrition situation of the target population in the two Counties. The indicators of special interest were the Individual Dietary Diversity Score Women (IDDS-W), Minimum Dietary Diversity of women (MDD-W) and Minimum Acceptable Diet (MAD) of infants and young children aged 6-23 months and Minimum Dietary Diversity-Women (MDD-W) for women of reproductive age. The baseline survey further aimed at examining the linkages between dietary diversity and complementary feeding practices, and knowledge and practice with regard to hygiene and nutrition among the women.

The cross-sectional NBS was conducted in 20 and 64 randomly selected villages in Turkana and Marsabit Counties, respectively. The survey covered a total of 487 households, 125 in Turkana County and 362 in Marsabit County. Structured questionnaires were used to collect data through face to face interviews with the women in their homesteads. The questionnaires were used to collect data on household socio-demographic characteristics, agricultural practices, water, sanitation and hygiene practices, childcare and feedings practices and nutritional knowledge among the women. The questionnaires also included the Household Food Insecurity Experience Scale (HFIES) which was used to assess the household food insecurity status. The qualitative 24-hour dietary recalls were used to assess the dietary intakes of the children and women.

The Individual Dietary Diversity Score Women (IDDS-W) and Minimum Dietary Diversity for Women (MDD-W) were calculated based on data from the 24-hour dietary recalls and based on the recommended ten food group classification. The MDD for the children aged 6-23 months was also computed based on data from qualitative 24-hour dietary recalls and based on seven food groups.

The mean age of mothers was  $28.4 \pm 6.8$  years, while that of children 6-23 months was  $14.4 \pm 5.3$  months. The household size ranged from 2-15 persons with a mean of  $5.9 \pm 2.2$  persons. Most of the mothers (74.5%) were in monogamous marriages, with a majority of them (78.6%) having some primary education. Most of the households (85.2%) were male-headed. Sale of animals and animal products was the main source of income for more than a half (58.5%) of the surveyed households, with the mean number of income sources of  $1.7 \pm 1.0$ .

Only 21.1% of the households had access to land that they could use for agriculture. The main crops grown by a majority of households were maize (88.3%), followed by legumes (73.8%), sorghum (13.6%) and Miraa (13.6%). Less than ten percent (8.0%) of the households had home gardens, in which 69.2% of them grew vegetables mainly during the wet season. Most of the households (78.4%) reared animals, mainly for own consumption and sale (52.6%) in approximately equal proportions. The animal products sold by a majority of households were live animals (80.5%), followed by milk (30.2%) and meat (20.6%). Firewood (21.4%) and charcoal (19.3%) were the main gathered products and crafts sold by households.

More than three quarters of the surveyed households (76.8%) had access to improved sources of drinking water during the dry/hot season, compared with slightly more than a half (54.6%) of households which had access to improved sources of water during the rainy/wet season. Less than one third of the households (28.5%) had access to improved toilet facilities. Soap was available in 61.4% of the households at the time of the survey. Most of the women (83.3%) used soap while washing hands. However, 66.9% of them washed their hands in a bowl of water shared by other people. Overall, 61.1% and 75.6% of respondents reported that they had not received any hygiene and nutrition counseling, respectively.

Only 5.6% of households were food secure, while 69.8% were severely food insecure. Mean IDDS-W was 3.2±1.2. Overall, 11.5% of the women received MDD (consumed foods from ≥5 out of ten food groups). Most consumed food groups were “grain, roots and tubers”, “legumes”, and “other vegetables”. The mean IDDS-C 6-23 months was 3.2±1.3. Less than one third of the children (21.9%) received MDD (consumed foods from ≥4 out of 7 food groups), while 71.4% received MMF. Overall, only 14.9% of the children achieved MAD. Figure 1 presents a summary of the major findings from the current NBS in relation to the food and nutrition security framework

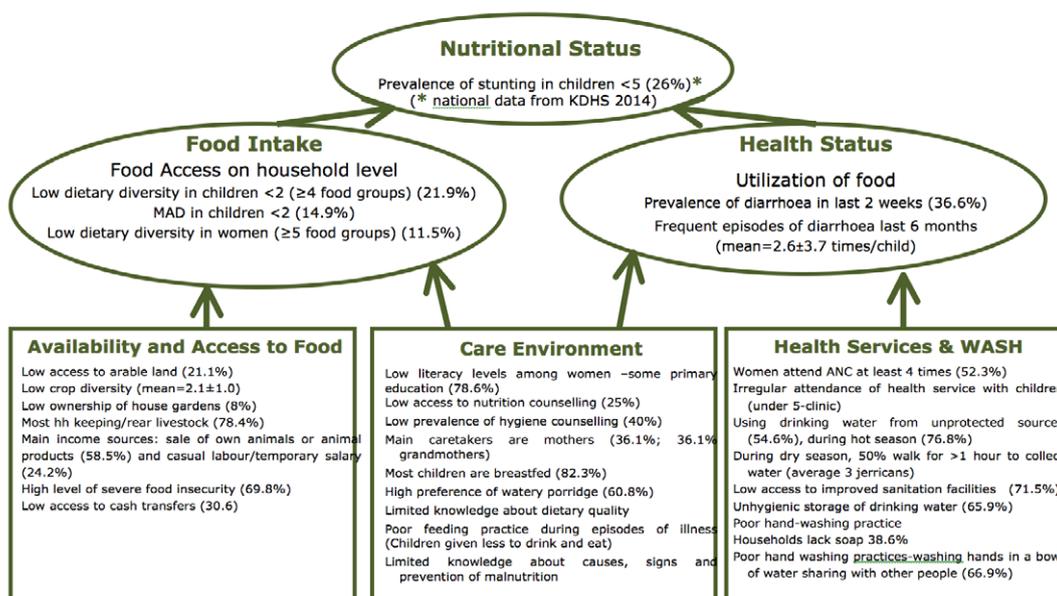


Figure 1: Results of the NBS presented according to the UNICEF Model



## 2. BACKGROUND AND OBJECTIVES

### 2.1. Country Context

The Republic of Kenya lies on the equator in Eastern Africa, bordering the Indian Ocean to the East of the African Continent. Kenya neighbours Ethiopia to the north, Somalia to the East, Tanzania to the South, Uganda to the West and Sudan to the North West. Kenya covers an area of approximately 580,000 km<sup>2</sup>, with an estimated population of 38.6 million people and a population density of 66 inhabitants per km<sup>2</sup> (ROK & KNBS 2010). Kenya's economy is largely based on agriculture, with about 85% of the population engaged in this sector, mainly as subsistence farmers.

Children and women of reproductive age are most vulnerable to suffer from malnutrition as a result of an unbalanced diet and lack of food diversity. Inadequate knowledge of healthy food choices and appropriate combinations of foods, as well as of childcare and optimal feeding practices, hinders households from benefiting from available nutrient-rich foods (UNICEF 1998). Families often lack appropriate skills needed to ensure proper food preparation, preservation and storage, resulting in decreased quantity and quality of available food, and consequently malnutrition (FAO 1997).

According to the latest Kenya Demographic and Health Survey (KDHS) 2014, about one quarter (26%) of Kenyan children aged below five years are stunted, with 8% being severely stunted (KNBS et al 2015). Further, an analysis of stunting by age groups showed that stunting rates were highest (36%) among children aged 18-23 months and lowest among those aged less than 6 months. Stunting levels were higher among rural children (29%) than urban children (20%). The prevalence of wasting was 4%, with 1% of the children being severely wasted. Wasting was highest among children in the age groups of 6-8 and 9-11 months (7% each), a period when infants and young children are introduced to complementary foods and are more vulnerable to diseases. The prevalence of underweight among under 5 year old was 11%, with 2% of the children being severely underweight. The prevalence of EBF increased from 32% in the 2008-09 KDHS to the current 61%. In addition, about 21% of children aged 6-23 months consumed an acceptable diet. An analysis of Body Mass Index (BMI) showed that 12% of women aged 15-49 years in Kenya were thin (BMI < 18.5 kg/m<sup>2</sup>), while the proportion of overweight (BMI ≥ 25 kg/m<sup>2</sup>) and obese (BMI ≥ 30 kg/m<sup>2</sup>) women increased from 23% in 2003 to 25% in 2008-09 (Kenya National Bureau of Statistics & ICF Macro (2010). According to the World Health Organization (WHO), stunting rates > 40% classify a severe public health and nutrition problem (WHO 1997).

Major causes of undernutrition include inadequate complementary feeding and care practices, such as low dietary diversity and poor quality foods. Additionally, diseases, poor water, inappropriate sanitation and hygiene practices, and other household and family factors contribute to malnutrition. Any shock in food availability and illnesses can trigger an increase in the already existing problem of undernutrition (UNICEF 1998).

## 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 the development of international goals, standards, and guidelines for global food and nutrition security under participation of the Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (BMZ). The NBSs were conducted in eleven countries including: Zambia, Malawi, Ethiopia, Benin, Burkina Faso, Cambodia, India, Kenya, Mali, Togo, and Yemen. The same survey tools were used during the baseline surveys across all the countries to enable the comparison of findings (Figure 2).



**Figure 2: Overview of countries that participated in the Nutrition Baseline Surveys<sup>1</sup>**

The focus of the Kenya country package was on two areas of intervention:

1. To set up coordination committees for nutrition at the county level in two counties and strengthening their coordination role, and planning and implementation capacities.
2. The target group-oriented collaboration with agriculture and healthcare service providers for the diversification of food intake through the cultivation of a wider variety of crops and vegetables.

## 2.3. Objective of the Nutrition Baseline Survey

### The causes of malnutrition

In 1990, UNICEF developed a comprehensive model that describes the inter-linkages between the multi-dimensional causes of malnutrition that occur at various levels within societies. The model is still widely used, and has been adapted in latest publications (i.e. LANCET 4/2013). It explains malnutrition both in rural and urban settings. All forms of malnutrition share a common cause: inappropriate diets that provide inadequate or excessive macronutrients and/or micronutrients. Yet, many other factors also play a role in malnutrition at different levels – as identified by the model, Figure 3.

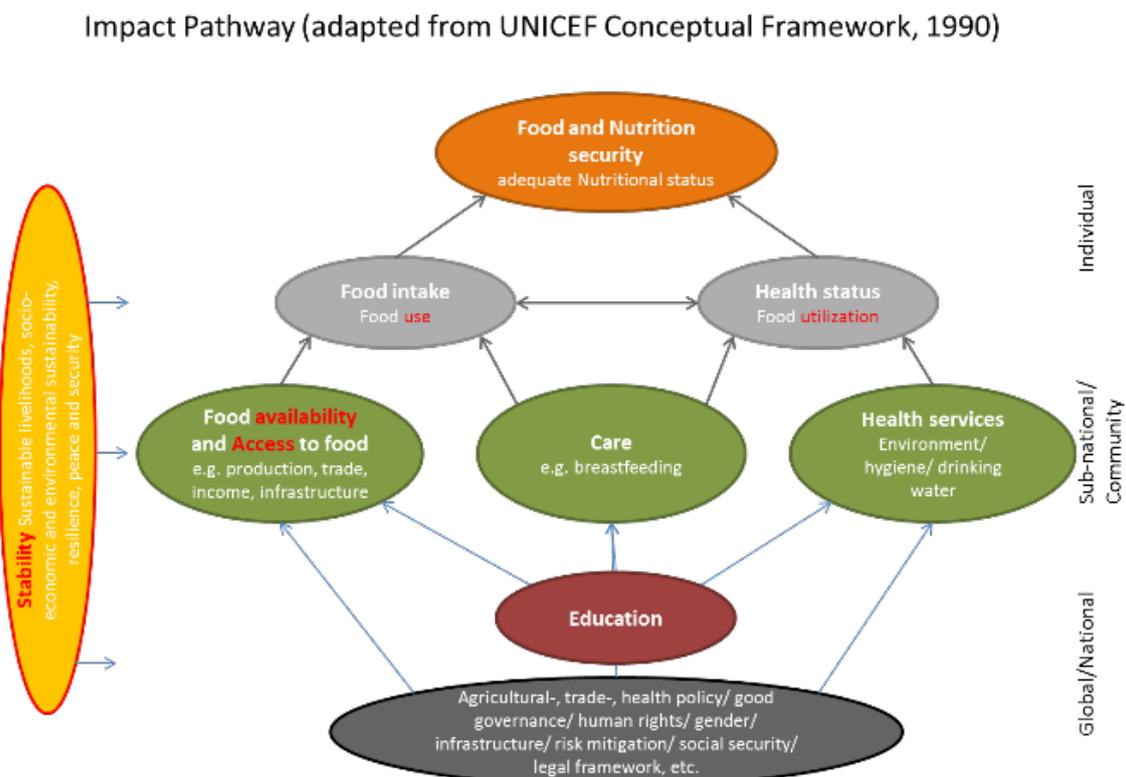


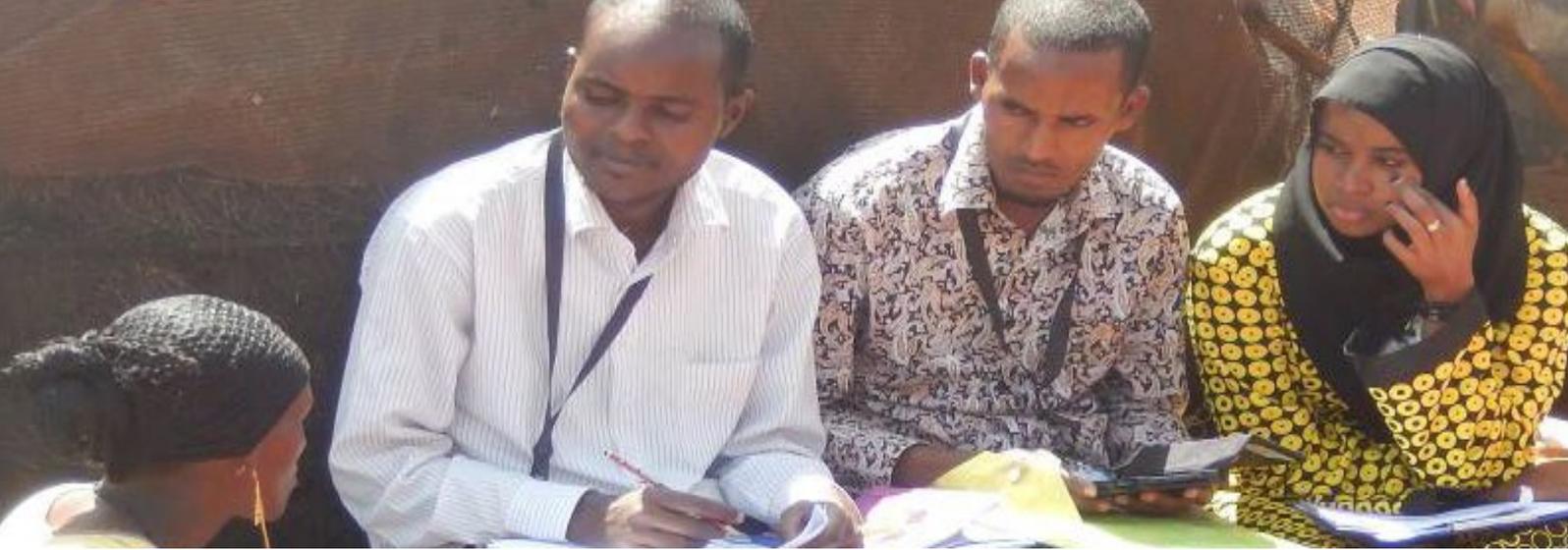
Figure 3: Impact pathway adapted from the UNICEF conceptual framework (1990)

- 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 are needed to design intervention that address the current situation of the potential beneficiaries. Therefore, the **objective** of this Nutrition Baseline Survey (NBS) was to provide reliable information on the food and nutrition situation of women of reproductive age and infants and young children in the project area. Women of reproductive age (15–49 years) and infants and young children (6-23 months) were chosen for this survey, because they are vulnerable to suffer from undernourishment and malnutrition. This is particularly true for households in fragile contexts, such as those in ASAL, who may often not be 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), a period during which inadequate nutrition and diseases can lead to irreversible damage with regards to the development of mental and/or motor skills as well as the immune system. Therefore, focusing on these target groups is vital in guaranteeing proper development of the individual and overall potential of the up-coming generations.

The main indicators of the NBS were:

- Household Food Insecurity Experience Scale (HFIES) for interviewed households
- Individual Dietary Diversity Score Women (IDDS-W) of mothers aged 15-49 years.
- Minimum Acceptable Diet (MAD) of infants aged 6-23 months.



## 3. METHODS

### 3.1. Project area and participants

#### Turkana County

Turkana County is situated in the North-western part of Kenya. It borders Uganda to the west, Sudan and Ethiopia to the North, Marsabit and Samburu counties to the east, and Baringo and West Pokot to the North. It covers an area of 77,000 Km<sup>2</sup>, which includes L. Turkana, that forms the eastern boundary and which is shared with Marsabit County. According to the Kenya Population and Housing Census 2009 results, the County population stood at 855,399 persons with an average population density of 12 persons per km<sup>2</sup> (ROK & KNBS (2010)). The county is administratively divided into 7 sub-counties, namely; Turkana North, Kibish, Turkana West, Turkana South, Loima, Turkana Central and Turkana South. The county is further divided into 17 divisions, 56 locations that are further sub-divided into 156 sub-locations.

Turkana County lies between Latitudes 0° 50' and 5° 30' N and Longitudes 34° 0' and 36° 40' E. Turkana county lies within three agro-ecological zones, LM5, LM6, and LM7, and is thus classified as arid and semi-arid lands (ASAL). Approximately 65% is very arid, 29% arid, 3% semi-arid, and 3% other lands. Annual precipitation, rainfall ranges from 1650 – 2800 mm/year. However, due to the very high evaporation rates, the county is generally hot and dry and is characterized by warm and hot climate. The temperatures range between 20°C and 41°C with a mean of 30.5°C. The rainfall pattern and distribution is erratic and unreliable with both time and space. There are two rainfall seasons. The long rains (akiporo) usually occur between April and July and the short rains between October and November and ranges between 52 mm and 480 mm annually with a mean of 200 mm. The driest periods (akamu) are January, February and September. This poses the twin challenges of low water storage especially in open reservoirs due to evaporation losses and low agricultural productivity. Annual mean temperatures experienced in the region ranges between 26 °C – 38 °C (Jaetzold and Schmidt, 1983). Turkana County is one of the poorest in Kenya with frequent droughts and famines. Main livelihood in the county is pastoral, which accounts for 60% of the population. Other livelihood zones include agro-pastoral mainly in the riverine areas of Turkwel and Kerio at 20%, while fisheries along the shores of Lake Turkana and formal employment located in major towns including Lodwar, Lokichar, Kakuma and Lokichogio account for 12% and 8% of livelihoods, respectively (KFSS 2015). The inhabitants of Turkana are largely pastoralist practicing a nomadic lifestyle. This makes livestock rearing a vital livelihood support sector.

The mean/average land holding size/ farm size for Turkana County is two acres per household. However, this land is communally owned and the figure represents the average holding size if it were to be shared (ROK, Turkana County Government).

In Turkana County, 23.9% of children aged below five years are stunted, with 7.1% being severely stunted, 22.9% are wasted with 4.4% being severely wasted, while 34% are underweight, with 9.8% being severely underweight (KNBS et al 2015).

### Marsabit County

Marsabit County is situated in the Northern part of Kenya. It neighbours Turkana County to the West, Samburu County to the South, Wajir County to the East and Ethiopia to the North. The county covers an area of about 75,750 km<sup>2</sup> and has a population of about 291,179 persons (ROK & KNBS (2010)). The county is composed of four sub-counties namely, Laisamis, Saku, North Horr and Moyale. The main livelihood zone in the county is pastoral, which account for about 80 percent of the total population. The other significant livelihood is the agro-pastoral livelihood zone which accounts for about 16 percent of the population. Other minor livelihood zones are formal employment and fishing (along Lake Turkana). The main source of income in the pastoral livelihood zone is livestock production which accounts for about 85 percent of all income. In the agro-pastoral livelihood zone livestock, food crop and cash crop production account for 50, 20 and 10 percent respectively of all income. Other minor sources of income in the county include petty trade, casual waged labour (Ministry of Agriculture, Livestock and Fisheries 2013). Marsabit has been reported to be one of the counties in a high prevalence of child malnutrition with 26.5% of children aged below five years being stunted, with 10.7 being severely stunted, 16.3% being wasted, with 5.1% being severely wasted and 30.1% being underweight, with 7.3% being severely underweight (KNBS et al 2015).

#### Participants and Sample Size

The current NBS targeted pairs of the following groups:

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

The calculation of the sample size, i.e. households with eligible participants, was based on the program target impact of a 0.5 food group increase in women<sup>1</sup>. The calculation of the necessary sample size was done with GPower. A sample size of 400, including 15% drop-outs, was estimated for the NBS Table <sup>1</sup>.

**Table 1: Sample Size calculation for SEWOH NBS**

Mean Baseline	Mean End-line	$\alpha$ error	Power 1- $\beta$ error	SD	N Base-line	N Endline	Total
Increase by 0.5 food groups							
4	4.5	0.05	0.95	2	347	347	694
3	3.5	0.05	0.95	2	347	347	694

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

## 3.2. Sampling procedure

Due to logistic challenges and the lack of up to date village list with household sizes, we were not able to apply the probability proportional to population sampling (PPS) sampling procedure. Therefore, the survey sites for the NBS in Turkana and Marsabit Counties were purposively selected based on first, the implementing partners' areas of work and secondly, the livelihood zones in the study area which included pure pastoral, agro-pastoral, salaried employment and fishing. The two main implementing partners in Turkana County are Kenya Red Cross and Save the Children International. Kaikor division in Kibish sub-county was selected in Turkana North since it is the main implementation area of the Kenya Red Cross, with the main livelihood zone being agro-pastoral. Save the Children International is the main implementing partner in Turkana South, Turkana Central and Loima sub-counties, where the main livelihoods zones include agro-pastoral, pastoral and salaried employment. Two divisions, namely Katilu and Lokichar, were purposively selected in Turkana south to cover the areas of operation of implementing partner Save the Children International and the livelihood zones (agro-pastoral, pastoral & employment), respectively. Random sampling was then applied using the RAND function in excel to select the villages where the NBS was conducted. A total of 20 villages were randomly selected using the RAND function in excel, 6 each from Katilu and Lokichar in Turkana South, and 8 from Kaikor division in Turkana North.

In Marsabit, the NBS was conducted in four sub-counties: Saku, Moyale, Laisamis/ Loyangalani and North Horr. The four sub-counties were grouped into three main groups in order to account for the livelihoods of the population, the high rates of global acute malnutrition (GAM) and the ethnic diversity with the support of Marsabit GIZ officer Kevina Wangai as follows: Saku/ Moyale where the livelihoods is agro-pastoralism and employment; Laisamis/ Loiyangalani (pastoralism/fishing, high rates of GAM and ethnic diversity (Rendille, Samburu and Turkana), and North Horr (pastoralism/fishing, high rates of GAM and ethnic diversity (Merille and Gabbra. Four sub-locations were randomly selected from each sub-county (16 sub-locations). Then, 4 villages were randomly selected from each sub-location, giving a total of 64 villages in which the NBS was conducted. A minimum of 5 households with women of reproductive age (15-49 years) with their children aged 6-23 months were randomly selected from each village to participate in the NBS. The list of selected villages for the NBS is presented in Annex A (Page 51).

Prior to data collection the research team visited each village to inform the chief about the survey and for community mobilization. The supervisors were responsible for coordinating the data collection in the field and in helping the enumerators with the identification of the survey households in each village. The inclusion criteria for the households to be sampled to participate in the NBS included: the household having at least one woman of reproductive age (15-49 year) and at least one child aged 6-23 months. Overall, households in the sampled villages were sparsely distributed and the enumerators had to walk for long distances to reach the target households. In case a village did not have enough households, additional households which met the inclusion criteria were sampled from the next nearby village, applying the same procedure. In case the sampled household had more than one child age group 6-23 months, the youngest child was enrolled.

## 3.3. Data collection

The data collection for the NBS took place between 29th January and 22nd February 2016. Two separate 5 days enumerator training workshops were conducted, one in Lodwar, Turkana between 22nd and 27th January 2016, and the second one in Marsabit between 3rd and 7th February 2016, (Annex B, page 553). A total of 12 enumerators and 2 supervisors were recruited and trained to participate in the NBS in Turkana. In Marsabit, 20 enumerators and 5 supervisors were recruited and also trained to participate in the baseline survey. During the data collection process, enumerators worked in pairs (teams of two). Enumerator 1 interviewed the respondents and recorded the paper based 24h-recalls, while enumerator

2 recorded answers in the tablet. The survey teams in Turkana and Marsabit were divided into two and five groups consisting of several enumerator teams, respectively. Each supervisor guided two to three enumerator teams during the actual data collection. Each enumerator team travelled and collected data from one to two sampled villages depending on the distance between the villages, and between the households and availability of respondents. Each enumerator team conducted a minimum of five interviews per day. Data for the NBS were collected using standardized questionnaires which were divided into different sections.

All interviews were conducted in the homestead of the selected respondent. During the interview, privacy was assured by keeping an adequate distance between the interviewee and other household members. After the interview, enumerators 1 and 2 compared the paper based and tablet version of the 24h dietary recalls to minimize recording biases. Furthermore, they recorded the GPS coordinates for each of the interviewed household.

Interviews were conducted according to the Nutrition Baseline Survey Interview Guide (Annex C page 55) to ensure standardization of the 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 during the children's 24h-recalls. Quality control during data collection was done every day by the assigned supervisors using the Quality Control Protocol for Interviewer (Annex D, page 57).

During data collection, the survey team worked in teams, each consisting of one supervisor and two to three enumerator teams. For each survey day, one or two villages were scheduled per group plus additional villages in case that the target number of mother-child-pairs was not found in the sampled villages. Each enumerator pair conducted at least three to five interviews per day.

After arriving in the village, the team introduced itself to the village chief, explained the random selection of households, and asked for permission to collect data.

### 3.4. Indicators and Design of the questionnaire

A standardized questionnaire was used to collect data about households' socio-economic situation, food security status, access to water and sanitation, dietary intake of children 6-23 months of age and women, as well as mothers/caretakers feeding practices (Table 2 and Annex E, page 69).

**Table 2: Overview of collected information and assessment instruments**

	Collected data	Assessment instrument
1	Socio-demographic information	Structured questions
2	Agriculture	Structured questions
	Access to land for agriculture, crops grown, most important crops, home gardening, vegetable production and use, fruit production/ access and use, livestock rearing and main use of reared animals, animals and animal products sold, gathered products/ crafts sold.	
3	Sanitation and hygiene situation	Structured questions
	Source of drinking water, walking distance to main water sources, amount of water consumed (jerricans) during different seasons.	
4	Food security status	Household food insecurity experience scale
5	Childcare and feeding practices	Structured 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 intakes of women (15-49 years)	24h dietary recall (qualitative)

### Household Food Insecurity Experience Scale

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, Table 3. The number of affirmative responses to the HFIES questions formed the raw score, which was used to determine the prevalence of food insecurity among 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 ranges from a minimum of 0 up to a maximum of 8. Households with a raw **score of 0 are classified as being food secure, 1-3 indicates mild food insecurity; 4-6 indicates moderate food insecurity, 7-8, severe food insecurity.** This simple method of food insecurity classification does not, however, 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<sup>(13)</sup>.

**Table 3: HFIES questions**

No.	Questions from HFIES	0=no, 1=yes
	During the last MONTH, was there a time when:	
1	You were worried that you would <b>not have enough food to eat</b> because of a lack of money or other resources? Worried not to have enough food	
2	You were <b>unable to eat healthy and nutritious food</b> because of a lack of money or other resources Unable to eat healthy and nutritious food	
3	You ate only <b>a few kinds of foods</b> because of a lack of money or other resources	
4	You had to <b>skip a meal</b> because there was not enough money or other resources to get food	
5	When you <b>ate less than you thought you should</b> because of a lack of money or other resources Ate less than should eat	
6	Your household <b>ran out of food</b> because of a lack of money or other resources Ran out of food	
7	You <b>were hungry but did not eat</b> because there was not enough money or other resources for food Were hungry but did not eat	
8	Was there a time when you or others in your household <b>went without eating for a whole day</b> because of a lack of money or other resources?	
	Score	0-8

### Dietary diversity

Dietary diversity was assessed and categorized with the indicators “Individual Dietary Diversity Score” (IDDS) and Minimum Dietary Diversity (MDD). Both indicators are used as a proxy measure of the nutritional quality of an individual’s diet. In the current survey, dietary diversity information of women and children 6-23 months was collected by conducting free qualitative 24h-recalls, whereby respondents are asked about the different types of food they (or their children respectively) had consumed the day preceding the interview (Annexes F and G, Pages 69 and 70). The different consumed food items were then assigned to predefined food groups and used to calculate IDDS and MDD.

#### Minimum Dietary Diversity - Women

Individual Dietary Diversity Score - Women (IDDS-W) was assessed based on a total of 10 food groups (FAO/FANTA 2014) (Table 4).

**Table 4: Food groups for 10 food group score with respective Kenyan food items**

1	Starchy staple foods	Foods made from Maize (ugali and porridge), cassava, grains like sorghum, millet, rice, wheat, oats, white (sweet) potatoes, white yams, green unripe banana
2	Beans and peas	Any foods made from mature beans or peas (fresh or dried), bambara nuts, lentils, soya, cowpeas.
3	Nuts and seeds	Any foods made from groundnuts, peanut-butter, tree-nuts, pumpkin seeds, sun-flower seeds, cashew nuts or seeds.
4	Dairy products	Milk (fresh or powder), cheese, yoghurt or other milk products (ice cream)
5	Flesh foods	Any kind of meat, organ meat, sea food, insects.
6	Eggs	Eggs from any kind of birds
7	Dark green leafy vegetables	Any dark green leafy vegetables including wild green vegetables like kales, cowpea leaves, cassava leaves, amaranth, bean leaves, pumpkin leaves,
8	Vitamin A rich fruit/ vegetables	Ripe mangoes, ripe Paw paws, ripe passion fruit, pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside
9	Other vegetables	Other vegetables like cabbage, eggplants, tomatoes, onions, pepper, green beans
10	Other fruits	Any other fruit like oranges, lemons, tangerines, bananas, avocado, coconut flesh, green/ unripe mangoes

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

#### **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 dietary intakes of the children, the primary care givers, who were mainly the mothers, were asked to recall all foods and drinks that the children had 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<sup>(15)</sup>.

1. Minimum dietary diversity (MDD) is defined as receiving foods from  $\geq 4$  out 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 5).

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

*Children 6–23 months of age who received foods from  $\geq 4$  food groups during the previous day*

---

*Children 6–23 months of age*

**Table 5: Food groups for 7 food group score with respective Kenyan food items**

1	Grains, roots and tubers	Foods made from Maize (ugali and porridge), bread, rice, chapatti, mandazi, noodles, spaghetti, scones, doughnuts, biscuits, boiled maize or any other foods made from grains like maize, sorghum, millet, rice, wheat, oats, white (sweet) potatoes, white yams, green unripe banana
2	Legumes and nuts	Any foods made from mature beans or peas (fresh or dried), bambara nuts, lentils, soya, cowpeas, velvet beans, groundnuts, sweet-mbalala, peanut-butter, tree-nuts, pumpkin seeds, sunflower seeds, cashew nuts or seeds including nut/seed butters
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, insects
5	Eggs	Eggs from any kind of birds
6	Vitamin-A rich fruit/vegetables	Any dark green leafy vegetables including wild green vegetables like cassava leaves, amaranth, bean leaves, pumpkin leaves, rape, mustard. Ripe mangoes, ripe paw paws, ripe passion fruit, pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside
7	Other fruits and vegetables	Any other fruit like oranges, lemons, tangerines, bananas, avocado, coconut flesh, green/ unripe mangoes Any other vegetables like cabbage, eggplants, tomatoes, onions, green pepper, green beans

**2. Minimum meal frequency (MMF)** 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.

*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*

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*Breastfed children 6–23 months of age*

and

*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*

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*non-breastfed children 6–23 months of age*

**MAD =the minimum acceptable diet** for breastfed children age 6-23 months receiving the minimum dietary diversity and the 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).

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

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*Breastfed children 6–23 months of age*

**and**

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

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*non-breastfed children 6–23 months of age*

### **Measuring Knowledge, Attitudes and Practices**

Nutrition-related knowledge, attitudes and practices (KAP) questions are a useful method for gaining an insight into peoples' personal determinants of their dietary habits and closely related hygiene and health issues. They can thus provide valuable inputs for effective programme and project planning. Nutrition-related KAP studies assess and explore peoples' KAP relating to nutrition, diet, foods and closely related hygiene and health issues. KAP studies have been used for two main purposes: 1) to collect key information during a situation analysis, which can then feed into the design of nutrition interventions and 2) to evaluate nutrition education interventions (FAO 2014). Several KAP questions 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 3)
- 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 diarrhoea, 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 diarrhoea, 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

- Among the crops produced by your household during the last cultivation season, which ones are the most important/ brought in the most income?
- What kind of vegetables do you grow/gather? (from the home garden or outside of the home garden), not buying at the market.
- What kind of fruits do you grow or fruit trees are accessible to you and your family?
- What type of farm animals/ livestock is reared in this household?
- Which animals or animal products do you sell?
- Which gathered products/or crafts do you sell (ask for products based on natural resources e.g. fire wood)?
- For how many months during the whole year does your own food production cover the needs of your family? (all food product, crops, animals products, wild foods etc: In a good year, how many months?/In a bad year, how many months?)
- What quantity of water (20 litre jerricans) is consumed by the household per day during the rainy/ wet season (minus the one used for animals)? *Record number of jerricans per day.*
- How long/ far do you have to walk/ trek to get household water during the rain/ wet season (round trip)
- What quantity of water (20 litre jerricans) is consumed by the household per day during the dry/ hot season (minus the one used for animals)? *Record number of jerricans per day.*
- How long/ far do you have to walk/ trek to get household water during the dry/hot season (round trip)?

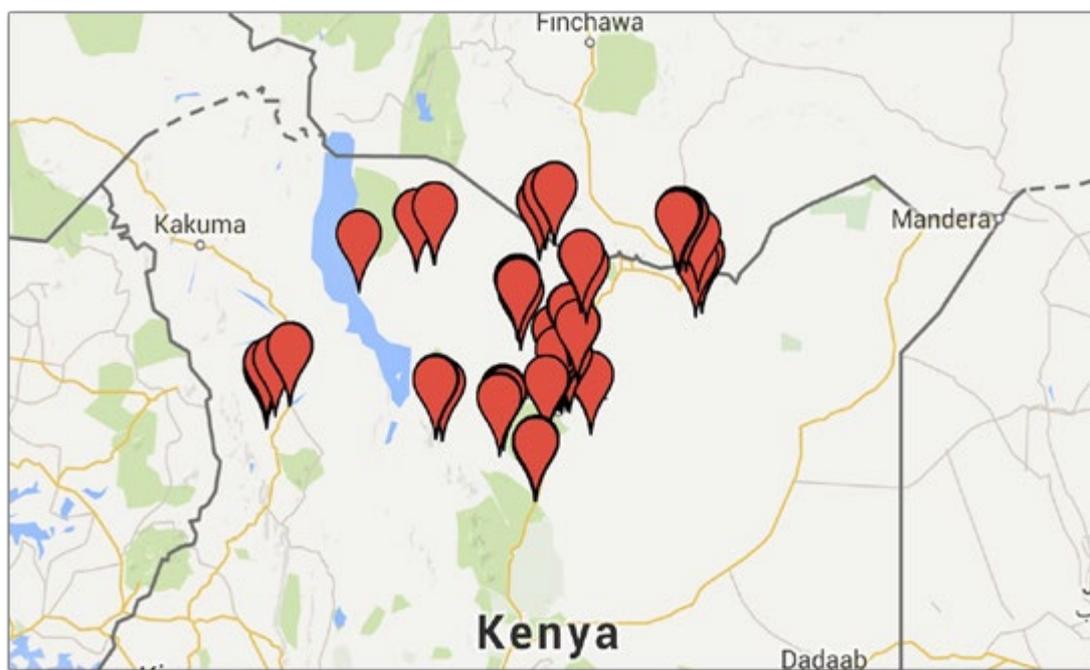
## 3.5. Data analysis

During the interviews with the mothers, the collected data was entered directly into the pre-tested tablets. At the end of each survey day, the collected data was downloaded from the tablets onto the computers and then transferred to IBM Statistical Package for Social Sciences (SPSS) Version 23 (IBM Corp 2015). After the completion of data collection, data were cleaned and analysed with IBM SPSS Statistics Version 23. Data were analyzed applying descriptive analysis, including mean, median (Md), standard deviation (SD), minimum (Min) and maximum (Max) and frequency distributions.



## 4. RESULTS

A total of 487 interviews were conducted, 125 in Turkana and 362 in Marsabit counties. In Turkana County, data collection took place in the three sub-counties namely: Lokichar, Katilu and Karlakor. In Marsabit County, data collection was carried out in five sub-counties: Laisamis and Loiyangalani, Saku, Moyale, North Horr. The respondents were women of reproductive age (15-49 years), mainly the mothers with at least one child aged between 6-23 months. Figure 4 shows the location of the selected households



Map prepared by Dr. Boran Altincicek

Figure 4: Map showing the survey areas in Turkana and Marsabit Counties

## Socio demographic information

Most respondents were in monogamous marriages (74.5%), followed by those who were in in polygamous marriages (16.0%), widowed (3.3%), divorced or separated (3.1%), and single (3.1%) (Table 6, page 16). Most households were male-headed (85.2%), while only 14.8 % were female-headed. The proportion of female-headed households was slightly lower in Marsabit County (9.4%) compared with Turkana County (30.4%).

**Table 6: Marital status of respondents**

Marital Status (%)	Total (N=487)	Turkana (n=125)	Marsabit (n=362)
Married monogamous	74.5	59.2	79.8
Married polygamous	16.0	29.6	11.3
Widowed	3.3	2.4	3.6
Divorced or separated	3.1	4.8	2.5
Single	3.1	4.0	2.8

The main reason given by the respondents for settling in the survey area was by virtue of being born in the area (68.6%), followed by marriage (26.5%), and due to fertile land or better livelihood (4.7%), (Table 7).

**Table 7: Reasons for settling in the area**

Reasons for settling in that area (%)	Total (N=487)	Turkana (n=125)	Marsabit (n=362)
Born in the area	68.6	75.2	66.3
Moved here by marriage	26.5	20.0	28.7
Fertile land/better livelihood	4.7	4.0	5.0
Other reasons	0.2	0.8	0.0

The **average household size (mean  $\pm$  SD) was 5.9 $\pm$ 2.2 persons** (Md=6, Min=2, Max=15) living permanently (reference period of half a year) in the respondent's household. Annex H (page 58) shows the distribution of household sizes. The mean household size in Turkana was 6.5 $\pm$ 2.1 persons (Md=6, Min=3, Max=12), while mean household size was 5.7 $\pm$ 2.2 members (Md=5, Min=2, Max=15) in Marsabit County. It is common practice that children, parents, and grandparents live in the same household in many rural communities in Kenya. All the respondents (100.0%) had some form of formal education. A **majority of the respondents (78.6%) had some primary education**, while only 2.3% had more than secondary education (Table 8).

**Table 8: Education Level of Respondents**

Level of education (%)	Total (N=487)	Turkana (n=125)	Marsabit (n=362)
No education	0.0	0.0	0.0
Primary	78.6	68.8	82.0
Secondary	18.9	28.8	15.7
More than secondary	2.3	3.2	1.9
Others	0.2	0.0	0.3

Respondents were asked to name the **sources of income for their households throughout the year**. The sale of own animals or animal products was the main source of income for more than half (58.5%) of the households, followed by casual labour/temporary salary (24.2%), sale of own produced crafts or gathered goods (20.5%), and small business (18.1%) (Table 9). **A comparison of income sources between the two counties showed that, while sale of own produced crafts or gathered goods was the main source of income among households in Turkana, sale of own animals or animal products was the main source of income among households in Marsabit county.**

**Table 9: Sources of income for the households**

Sources of income	Total (N=487) (%)	Turkana (n=125) (%)	Marsabit (n=362) (%)
Sale of own produced crops	10.5	18.4	7.7
Sale of own animal or animal products	58.5	36.8	66.0
Sale of own produced crafts or gathered goods	20.5	50.4	10.2
Casual labour/temporary salary	24.2	24.0	24.3
Small business	18.1	42.4	9.7
Employment/ regular salary	5.7	2.4	6.9
Remittances from relatives/husband	13.6	14.4	13.3
Income generated by sale or exchange of public transfers	14.6	20.0	12.2
Subsistence farming	4.9	14.4	1.7



**Figure 5: Sources of income in Turkana and Marsabit**

Overall, a half of the households (50.3%) had one source of income throughout the year. Of the nine possible income sources, the mean number of income sources per households was  $1.7 \pm 1.0$  (Md=1, Min=0, Max=8). Three households reported not having any source of income throughout the year. On average households in Turkana county had more diverse income sources (mean $\pm$ SD=2.3 $\pm$ 1.5, md=2, Min 0, Max= 8) compared with those from Marsabit (mean $\pm$ SD=1.5 $\pm$ 0.7, md=1, Min 0, Max= 5).

## 4.1. Agriculture

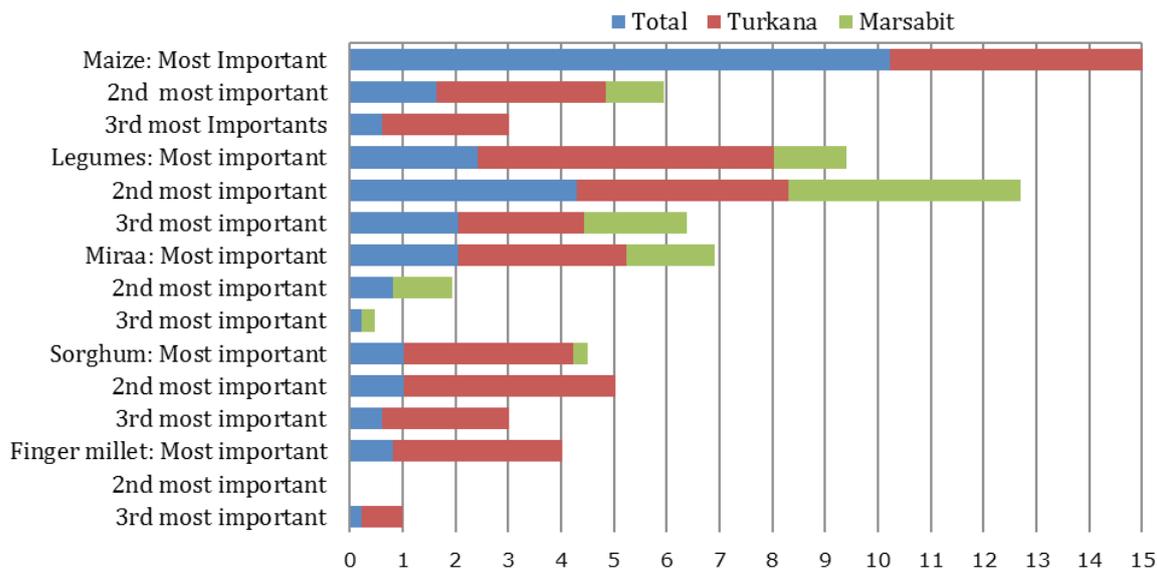
The respondents were asked if they or any members of their households had access to any land that could be used for agriculture. **Overall, only 21.1% (n=103) of the households reported to have access to land that could be used for agriculture, with a** slightly higher proportion in Turkana (29.6%) compared with Marsabit (18.2%). Most of the households that had access to agricultural land grew maize (88.3%), followed by legumes (73.8%), sorghum (13.6%) and miraa (13.6%), Table 10. Next to maize, the other main crops produced by households in Turkana included legumes (51.4%) and sorghum (37.8%), while household in Marsabit produced more legumes (86.4%) and miraa (19.7%).

**Table 10: Crop diversity**

Crop production (%)	Total (N=103)	Turkana (n=37)	Marsabit (n=66)
Maize	88.3	86.5	89.4
Finger millet	2.9	8.3	0.0
Sorghum	13.6	37.8	0.0
Teff	1.0	0.0	0.0
Irish potatoes	2.9	5.4	1.5
Orange fleshed sweet potatoes	1.9	5.4	0.0
Cassava	1.9	2.7	1.5
Green banana	3.9	0.0	6.1
Legumes	73.8	51.4	86.4
Groundnuts	1.0	2.7	0.0
Miraa	13.6	2.7	19.7

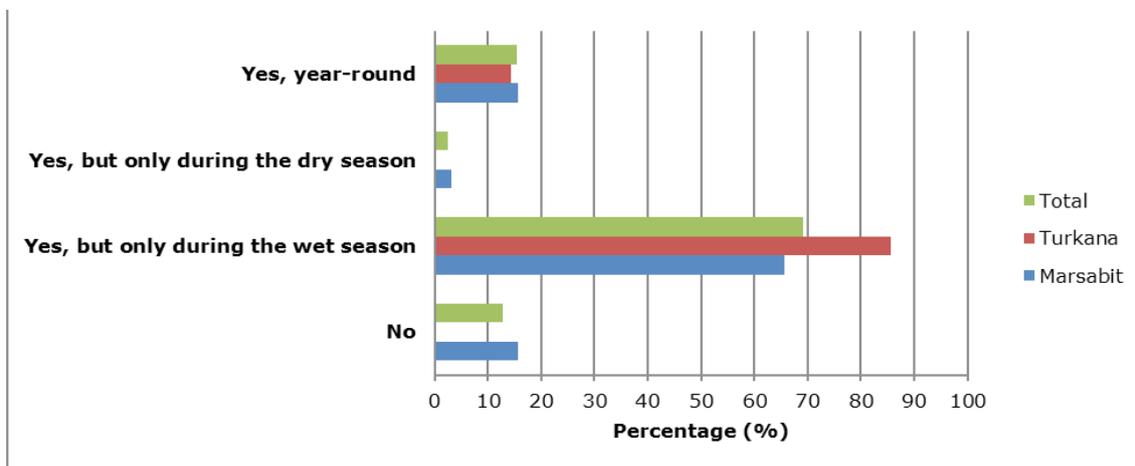
Overall, **crop diversity was low in the survey areas**, with a half of the households (51.0%) **growing an average of two different crops on their land in the previous one year** (mean $\pm$  SD= 2.1  $\pm$ 1.0, Md=2, Min=0, Max=6). The mean number of different crops grown in Turkana County (Mean $\pm$ SD=2.0  $\pm$ 1.4, Md=2, Min=0, Max=6), did not differ from that in Marsabit County (Mean $\pm$ SD= 2.1  $\pm$ 0.8, Md=2, Min=0, Max=4).

**Maize was the most important crop** (crop that brought in the most income) for nearly a half (48.5%) of the surveyed households that reported producing crops during the previous cultivation season (64.9% in Turkana, 39.4% in Marsabit), Figure 6 (Page 19). **Legumes were the second most important crop** for 11.5% of households (18.9% in Turkana, 7.6 in Marsabit), followed in **third position by miraa** which was the most important crop for 9.7% of households (10.8% in Turkana, 9.1% in Marsabit), while **sorghum was the fourth** most important crop for 4.9% of households (10.8% in Turkana, 1.5% in Marsabit).



**Figure 6: Crops that are most important or brought in the most income during the last cultivation season**

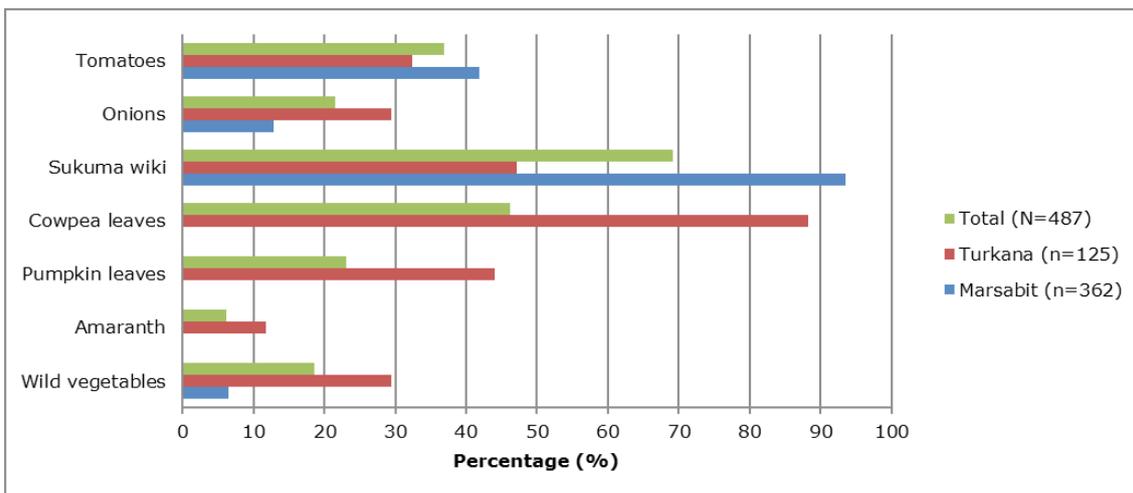
Only 8% (n=39) of the households reported having home gardens, with a lower proportion in Turkana (5.6%) compared with Marsabit (8.8%). Among the households that had home gardens, 69.2% grew vegetables mainly during the wet season, 15.4% throughout the year, and 2.6% during the dry season, Figure 7. The same phenomena were observed in Turkana and Marsabit counties, where most of the households (87.5% and 65.6%, respectively) grew vegetables mainly during the wet season.



**Figure 7: Vegetable production in home gardens during different seasons of the year.**

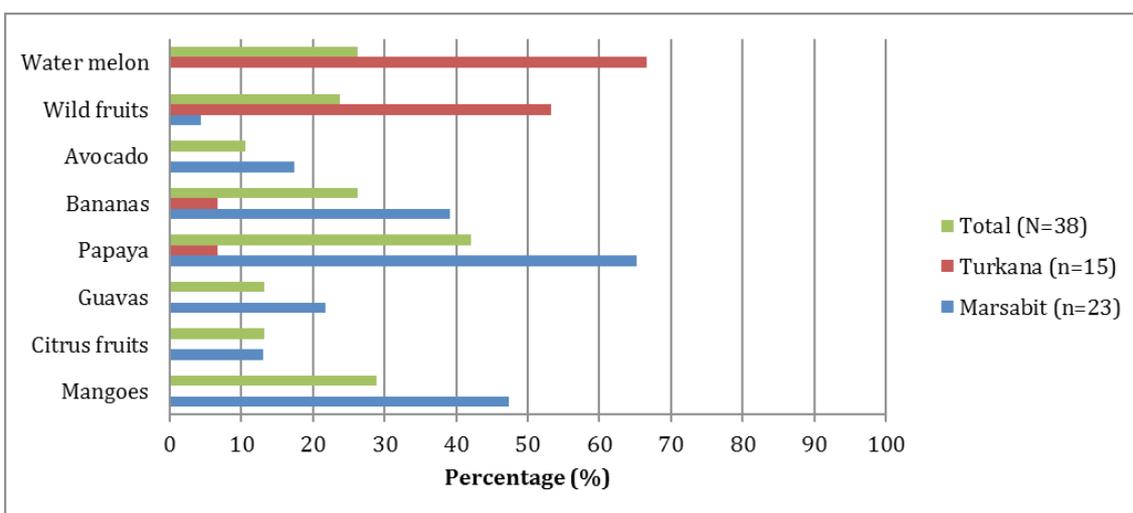
The respondents were further asked if they grew vegetables in any other places other than in the home gardens. Overall, only 5.3% and 3.7% of the respondents grew vegetables on irrigated and rain-fed land, respectively. Comparing the two counties, a fifth (20.0%) and only 0.3% of respondents grew vegetables on irrigated land in Turkana and Marsabit, respectively.

Sukuma wiki (69.2%) and cowpea leaves (46.2%) were the main types of vegetables grown/ gathered by households in the survey area, Figure 8. A majority of household in Turkana (88.2%) and Marsabit (93.5%) grew/ gathered cowpea leaves and sukuma wiki, respectively.



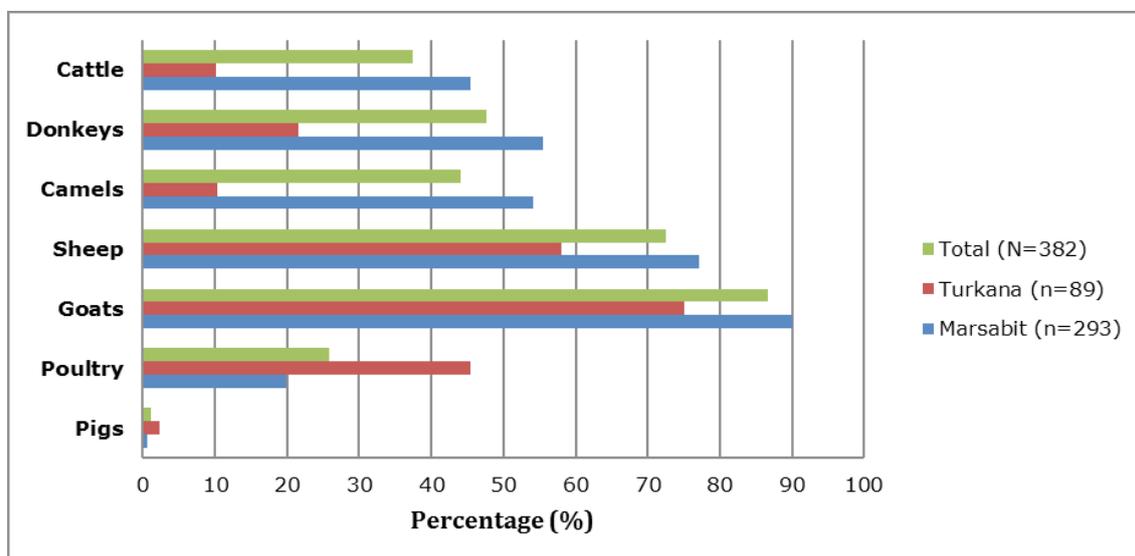
**Figure 8: Kind of vegetables grown/ gathered from the home garden or outside of the home garden**

The results with regard to home gardening, vegetable production, access to fruits, animal rearing and their uses are also summarized in **Fehler! Verweisquelle konnte nicht gefunden werden..** Approximately two thirds of households (66.2%) in the survey area used **the vegetables produced/ gathered mainly for own consumption** (55.9% in Turkana, 77.4% in Marsabit). **Only 7.8% (n=38) of the households grew fruits or had access to fruit trees** (12.0% in Turkana, 6.4% in Marsabit), Figure 9 (Page 21). Among the households that reported growing fruits or having access to fruits in Turkana (n=12), 66.7% and 53.3% grew or had access to water melons and wild fruits, respectively. On the other hand, papaya (62.2%), followed by mangoes (47.3%) and bananas (39.1%) were grown or accessible to households in Marsabit. Guavas, citrus fruits and mangoes were mainly grown/accessible to households in Marsabit County, unlike in Turkana County.



**Figure 9: Kind of fruits grown or fruit trees accessible to households**

Animals were reared by a majority (78.4%) of households (71.2% in Turkana, 89.1% in Marsabit). Goats (86.6%) and sheep (72.6%) were reared by most of the interviewed households, with a higher proportion of households in Marsabit compared with Turkana, Figure 10.



**Figure 10: Types of animals reared by household**

Further, cattle (45.5% vs. 10.2%), donkeys (55.5% vs. 21.6%) and camels (54.1% vs. 10.3%) were reared by more households in Marsabit compared with Turkana. The main reason given for rearing animals by 35.3% of the households was mainly for own consumption and sale in approximately equal amounts, followed by less than a third of the households who kept animals mainly for own consumption, and less than a fifth of households for sale. Less than five percent of the households reared pigs. The reasons given for rearing animals by more than a half (52.6%) of the respondents was mainly for both own consumption and sale in approximately equal amounts (52.6 in Turkana, 52.8 in Marsabit), Table 11 (Page 244).

**Table 11: Home gardening, vegetable production, livestock rearing and main uses of produce**

	Total (N=487)	Turkana (n=125)	Marsabit (n=362)
Household have home gardens (%)	N=487	N=125	N=362
No	92.0	94.4	91.2
Yes	8.0	5.6	8.8
Grow vegetables in home garden (%)	N=39	N=7	N=32
No	12.8	0.0	15.6
Yes, but only during the wet season	69.2	85.7	65.6
Yes, but only during the dry season	2.6	0.0	3.1
Yes, year-round	15.4	14.3	15.6
Grow vegetables in other place apart from home garden (%)	N=487	N=125	N=362
No	91.0	75.2	96.4
Yes, on irrigated land	5.3	20.0	0.3
Yes, on rain-fed land	3.7	4.8	3.3

	Total (N=487)	Turkana (n=125)	Marsabit (n=362)
Main use of vegetables produced/ grown (%)	N=65	N=34	N=31
Mainly for own consumption	66.2	55.9	77.4
Mainly for sale	9.2	17.6	0.0
Both (in approx. equal amounts)	24.6	26.5	22.6
Household grows or has access to fruit trees (%)	N=487	N=125	N=362
No	92.2	88.0	93.6
Yes	7.8	12.0	6.4
Main use of fruits grown/ accessible to household (%)	N=38	N=15	N=23
Mainly for own consumption	71.1	60.0	78.3
Mainly for sale	10.5	26.7	0.0
Both (in approx. equal amounts)	18.4	13.3	21.7
Household ownership/ rearing of animals (%)	N=487	N=125	N=362
No	21.6	28.8	19.1
Yes	78.4	71.2	80.9
Main use of livestock produce (N=275)	N=382	N=89	293
Own consumption	16.4	12.6	21.6
For sale	36.4	37.1	35.3
Both (in approx. equal amounts)	35.3	37.1	32.8
Cultivation/transport	12.0	13.2	10.3

Respondents were asked how many months during the whole year that their own food production covered the needs of their families during both a good year and bad year. Overall, the mean  $\pm$ SD numbers of months that own food production was able to cover the needs of families in a good and bad year were  $3.4\pm 2.7$  and  $1.8\pm 2.5$  months respectively. Own food production was able to cover the needs of families for more months in both a good and bad year in Turkana (mean $\pm$ SD= $4.6\pm 2.4$  vs.  $3.0\pm 2.4$ ) compared with Marsabit (mean $\pm$ SD= $3.0\pm 2.7$  vs.  $1.4\pm 2.4$ ), respectively.

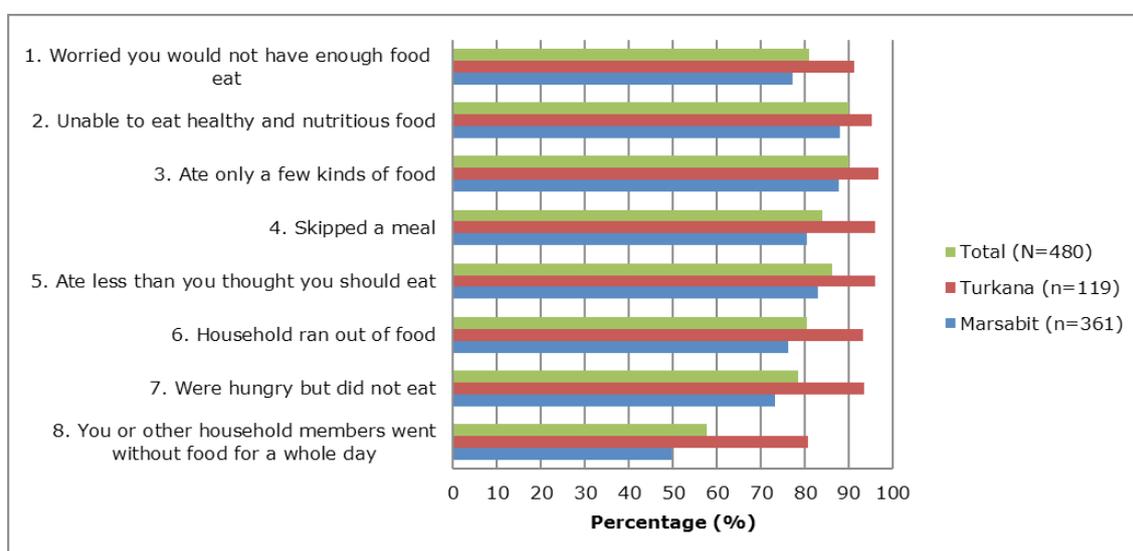
The respondents were further asked if they or any members of their households participated/ benefitted from any social- and/or food-security programmes. Almost an equal proportion of household members in the survey area (60.0%), and also in both Turkana (59.2%) and Marsabit (60.2%) participated in school feeding programmes (Table 12). More households in Turkana County participated in food aid (70.4%) and agricultural development (19.2%) programmes compared with those in Marsabit, 5.2% and 1.7%, respectively.

**Table 12: Household participating in social- and food-security programmes**

Programmes (%)	Total (N=487)	Turkana (n=125)	Marsabit (n=362)
School feeding	60.0	59.2	60.2
Agricultural development	6.2	19.2	1.7
Cash transfer	30.6	30.4	30.7
Food aid	22.0	70.4	5.2
Food for assets/work	11.9	8.8	13.0
Food aid	22.0	70.4	5.2
Supplementary feeding	13.3	N/A	13.3

## 4.2. Household food insecurity status

The standardised “Household Food Insecurity Experience Scale” (HFIES), developed by FAO, was used to assess household food insecurity status (FAO 2015). The HFIES includes a set of 8 occurrence questions with a reference period of the previous four weeks (one month) directed to the respondent. The respondents were asked if: 1) they had worried that they would not have enough food to eat because of lack of money or other resources, (2) there was a time they were unable to eat healthy and nutritious food because of lack of money or other resources, (3) they ate only a few kinds of foods because of lack of money or other resources, (4) had to skip a meal because there was not enough money or other resources to get food, (5) there was a time they ate less than they thought they should because of lack of money or other resources, (6) if their household ran out of food because of lack of money or other resources, (7) they were hungry but did not eat because there was not enough money or other resources for food (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). The responses to the eight HFIES questions are presented in Figure 11.



**Figure 11: Respondents responses to the eight HFIES questions**

Overall, only 5.6%, of households in the survey area were food secure (2.5% in Turkana, 6.6% in Marsabit), Table 13 and Figure 16. More than two thirds of households (69.8%) were severely food insecurity during the previous month. A comparison of the two counties showed that a higher proportion of households were severely food insecure in Turkana (89.1%) compared with Marsabit (63.4%)

**Table 13: Household food insecurity status**

HFIES score (%)	Total N=480	Turkana N=119	Marsabit N=361
Food secure (score 0)	5.6	2.5	6.6
Mild food insecure (score 1-3)	8.8	2.5	10.8
Moderate food insecure (score 4-6)	15.8	5.9	19.1
Severe food insecure (score 7-8)	69.8	89.1	63.4

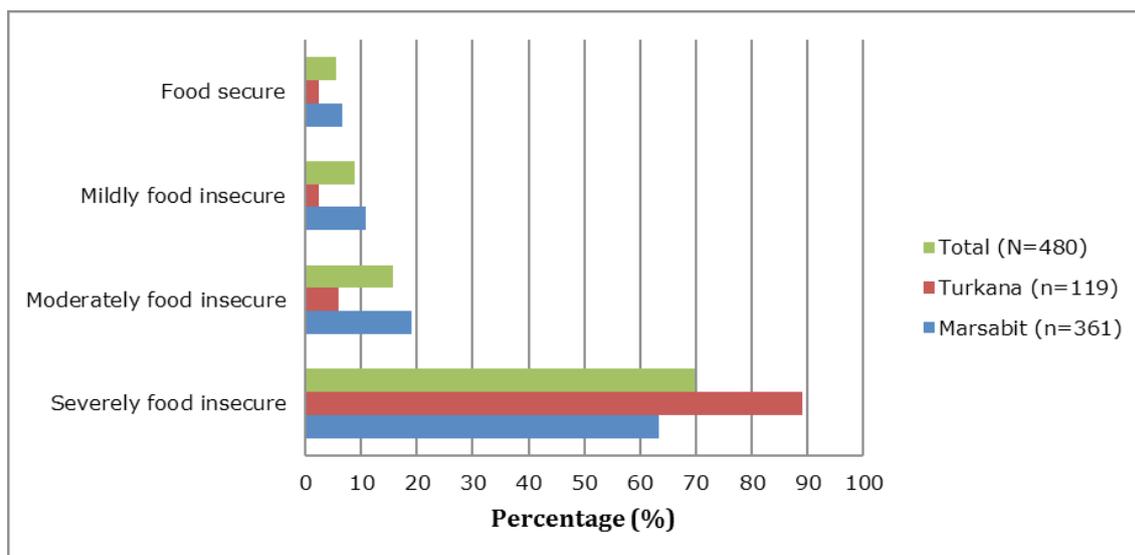


Figure 12: Household food insecurity status in the survey area

### 4.3. Water, Sanitation and Hygiene

The main sources of water for the households during the rainy/ wet and dry/ hot seasons were also assessed during the baseline survey. An improved source of water was defined as piped water into dwelling, yard or plot, public tap or standpipe, tube well or borehole, protected dug well or protected spring and rainwater collection, while a non-improved source of water included: unprotected spring, unprotected dug well, cart with small tank/drum, tanker truck, surface water (river, stream, dam, lake, pond, canal or irrigation channel).

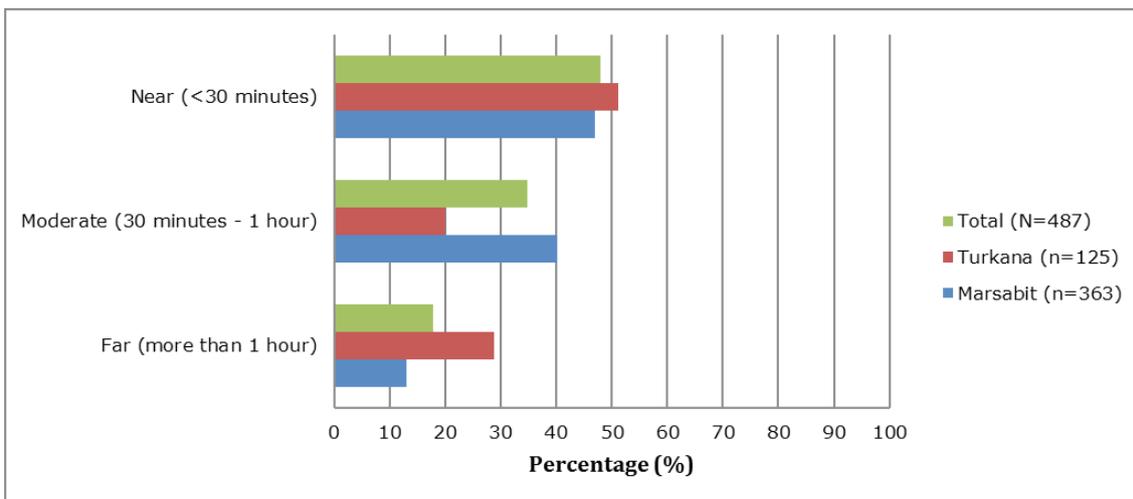
Overall, the main sources of drinking water for household members varied during the rainy/wet and dry/ hot seasons. **During the rainy/wet season 54.6% of households accessed their drinking water from unprotected sources including unprotected springs, unprotected dug wells and surface water.** Most households in Marsabit (70.4%) used drinking water from unprotected sources during the rainy/ wet season compared with only 8.8% of households from Turkana County. **During the dry/hot season, most household (76.8%) had access to improved sources of drinking water** (91.2% in Turkana, 71.8% in Marsabit).

The respondents were asked to estimate the quantity of water (in 20 litre jerricans) consumed in their households per day during the rainy/wet and dry/hot seasons. **The households consumed about the same amount of water during both the rainy/wet and dry/ hot seasons (mean±SD=3.3±2.2 and 3.2±2.7 jerricans), respectively.** Households in Turkana County consumed more water per day during both the rainy/ wet and dry/hot seasons (mean±SD=3.8±2.3 and 3.9±4.10 jerricans) compared with those from Marsabit County (mean±SD=3.2±2.4 and 3.0± 1.9 jerricans).



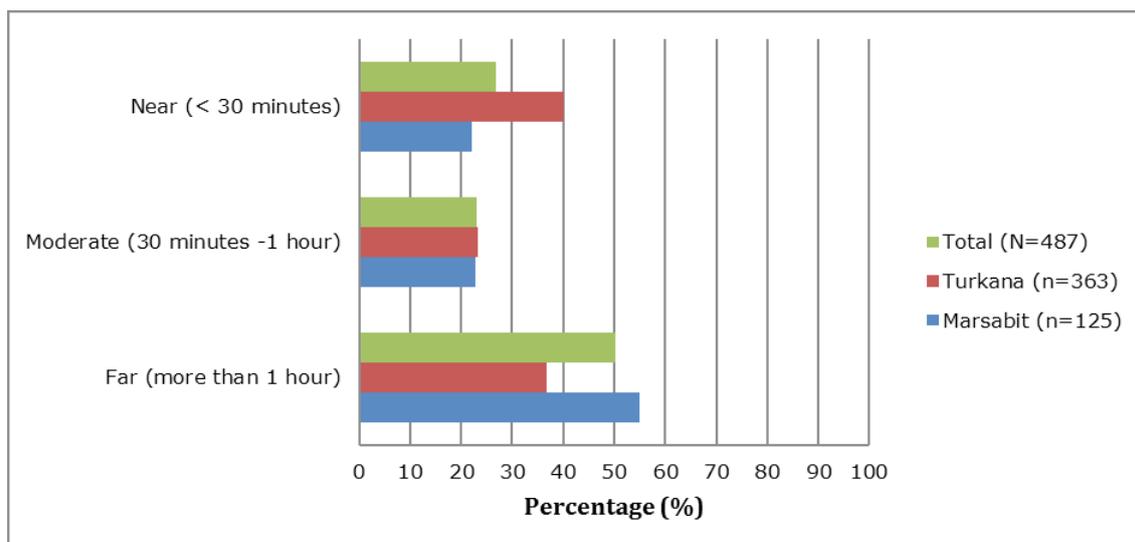
**Figure 13: Sources of water**

With regards to the distance and time taken to get household water, nearly a half of the respondents (48.0%) had to walk/ trek for less than 30 minutes to get household water during the rainy/ wet season (51.2% in Turkana, 47% in Marsabit), Figure 13. A higher proportion of households in Turkana (28.8%) had to walk far (for more than one hour) to get household water during the rainy/ wet season compared with 13.0% in Marsabit.



**Figure 14: Walking distance (round trip) to get household water during the rainy/ wet season**

During the dry/ hot season, 50.3% of the respondents had to walk/ trek far (more than one hour) to get household water, Figure 14. A higher percentage of respondents in Marsabit (55.0%) walked/ trekked far to get household water compared to their counterparts in Turkana (36.8%) during the dry/ hot season.



**Figure 18: Walking distance (round trip) to get household water during the dry/ hot season**

The methods used by respondents to store drinking water are presented in Table 14. The category “clean and covered container/jar” is considered the most appropriate way of storing drinking water. Using dirty and uncovered containers to store drinking water increases the risk of contamination due to exposure to pathogens that may enter the water for example through contact with dirt/dust (carried though the wind) or animals (drinking the water). Overall, a third of the respondents (33.9%) stored their drinking water in clean and covered containers. While most (79.2%) of respondents in Turkana stored their drinking water in clean and covered containers, only 18.2% of respondents in Marsabit used clean and covered containers to store their drinking water.

**Table 14: Storage of drinking water**

Way of storage (%)	Total (N=487)	Turkana (n=125)	Marsabit (n=362)
Clean container or jar	1.2	4.0	0.3
Covered container	64.7	16.8	81.2
Clean and covered container or jar	33.9	79.2	18.2
Others	0.2	0.0	0.3

The respondents were further asked, if they did anything to their water before drinking. Only 19.5% of the respondents reported doing something to their water before drinking (15.2% in Turkana, 21.0% in Marsabit). Addition of bleach/ chlorine/ water guard was the most (73.7%) common method of treating drinking water among the respondents who reported that they did something to their drinking water (n=95). While 31.6% and 21.1% of respondents in Turkana boiled or added bleach/ chlorine/ water guard to their drinking water to make it safe respectively, addition of bleach/ chlorine/ water guard was the main method used by 86.8% of the respondents in Marsabit to make drinking water safe, Table 15.

**Table 15: Methods of treating drinking water**

Treatment of drinking water (%)	Total (N=487)	Turkana (n=125)	Marsabit (n=362)
Do not do anything to drinking water	80.5	84.8	80.5
Do something to drinking water	19.5	15.2	19.5
Treating drinking water	n=95	n=19	n=79
Nothing	8.4	42.1	0.0
Boil it	13.7	31.6	9.2
Add bleach/chlorine/ water guard	73.7	21.1	86.8
Use a water filter	4.2	5.3	3.9

**Access to and the type of toilet facilities** used by the households was also assessed. An “improved” sanitation facility is one that hygienically separates human excreta from human contact and included pit latrine with slab and composting toilet. **Majority of the households (71.5%) did not have access to toilet facilities (80.0% in Turkana, 68.5% in Marsabit). Further, most of the households (75.8%) used unimproved toilet facilities (84.8% in Turkana, 72.7% in Marsabit)**

**Soap was available in 61.4% of the households at the time of the interview (60.0% in Turkana, 61.9% in Marsabit).** The respondents were asked what they used the soap for during the previous day and on the day of the interview. Majority of the respondents (87.1%) reported that the last time they had used soap was mainly for personal hygiene (washing the body and hair, washing clothes, dishes and pots, and cleaning the house). Similarly, most households in Turkana (83.2%) and Marsabit (88.4%) used soap mainly for personal hygiene. If the respondents mentioned that they used soap for washing hands, the enumerators had to probe further for the occasion when soap was used. Washing hands with soap was common among the women, as 85.3% of the women mentioned that they used soap while washing hands (78.1% in Turkana, 87.6% in Marsabit). The various occasions when the women washed hands are presented in Table 16.

**Table 16: Occasions when soap was used for washing hands**

Hand washing occasion (%)	Total (N=487)	Turkana (n=125)	Marsabit (n=362)
Washing my children’s hands	26.5	50.4	18.2
Washing hands after visiting toilet (defecation)	34.3	43.5	31.3
Washing hands after cleaning the child (after defecation)	27.3	40.8	22.7
Washing hands before feeding the child	26.5	48.8	18.8
Washing hands before preparing food	22.4	39.2	16.6
Washing hands before eating	36.3	50.4	31.5
Washing body, hair, clothes, dishes and pots, cleaning the house	87.1	83.2	88.4

The respondents were further asked **to describe step by step how they usually washed their hands.** Washing hands in a bowl of water (sharing with other people) and not using soap was classified as a poor hand washing practice, since the water is only clean for the first person. Hand washing with someone pouring a little clean water from a jug onto one’s hand or washing hand under running water is considered to be an improved hand washing option. Using soap or ashes in addition to pouring a little clean water from a jug or running water were the most appropriate practices. **More than a half (54%) of the respondents mentioned washing hands in a bowl of water shared with other people** and using soap (24% in Turkana, 64.4 % in Marsabit), (Table 17).

**Table 17: Mentioned ways of washing hands**

Hand-washing practice (%)	Total (N=487)	Turkana (n=125)	Marsabit (n=362)
<b>Washes hands in a bowl of water (sharing with other people) without soap or ash</b>	12.9	17.6	11.3
<b>Washes hands in a bowl of water (sharing with other people) with soap or ash</b>	54.0	24.0	64.4
<b>Washes hands with someone pouring water from a jug onto one's hands or under running water without soap or ash</b>	3.3	9.6	1.1
<b>Washes hands with someone pouring water from a jug onto one's hands or under running water with soap or ash</b>	27.5	47.2	20.7
<b>Washes hands under running water without soap</b>	0.4	1.6	0.0
<b>Washes hands under running water with soap or ash</b>	1.8	0.0	2.5

The respondents were asked if they had ever received any hygiene counselling. Overall, 38.8% reported to have received some hygiene counselling. A higher proportion of respondents in Turkana (68.8%) compared to Marsabit (28.5%) had received some hygiene counselling.

## 4.4. Diarrhoea

High prevalence of diarrhoea as well as frequent diarrhoea episodes can be an indicator for poor sanitation and hygiene environment (UNICEF 1998). In order to assess child health, the respondent was asked if the child had diarrhoea in the past two weeks prior to the survey date. Further, the respondents were asked to **recall the frequency of diarrhoea episodes among the children six months preceding the interview**. The overall prevalence of diarrhoea was 36.6%, with a higher proportion of children in Turkana (44.3%) compared with Marsabit (34.0%) reported to have had an episode of diarrhoea in the two weeks preceding the survey. Approximately a third of the children (35.2%) were reported not to have had any diarrhoea in the past six months (19.7% in Turkana, 40.5% in Marsabit). **The mean number of times that the children were reported to have had diarrhoea in the previous six months was 2.6± 3.7** (Md=2, Min=0, Max=30). The occurrence of diarrhoea was higher in Turkana (mean ±SD=3.6±3.9, Md=3, Min=0, Max=30) compared with Marsabit (mean± SD=2.2±3.6; Md=1.0, Min=0, Max=30). The occurrence of diarrhoea among infants and young children in this population could be attributed to several underlying factors, including inappropriate sanitation and hygiene practices, which need to be addressed.

## 4.5. Knowledge, attitudes and practices with regards to health aspects

The respondents were mainly the mothers of the children aged 6-23 months in the survey area. The mean±SD age of the mothers was 28.4±6.8 years, (Md=27, Min=16, Max=49). The mean age of mothers in Turkana was 29.0 ±7.2 years (Md=28, Min=16, Max=47 years), while it was 28± 6.7 years (Md=25, Min=17, Max=49 years) in Marsabit. It is recommended that women attend at least 4 antenatal care visits during pregnancy. The respondents were asked to recall the number of times they had received antenatal care and attended the under 5 clinic while they were pregnant with the index children. The mean number of times that the mothers received antenatal care during their pregnancy with the index child was 3.2±1.8 (Md=4, 1.6, Min=0, Max=8). The number of times that mother received antenatal care was

similar in Turkana (Mean  $\pm$ SD=3.2 $\pm$ 1.5, Md=4, Min=0, Max=7) and Marsabit (Mean  $\pm$ SD=3.2 $\pm$ 1.8, Md=4, Min=0, Max=8). More than half of the mothers (52.3%) attended four or more antenatal care visits during pregnancy (57.3% in Turkana, 50.7% in Marsabit).

Mothers are supposed to take their children to the under 5 clinic every month for growth monitoring and other services targeted at improving the overall health and nutritional status of infants and young children aged below five years. Overall, the mean  $\pm$ SD number of under 5 clinic visits with the index child was 4.7 $\pm$ 1.6 times (Md=5, Min=0, Max=12). The mean number of under 5 clinic visits was 4.3 $\pm$ 1.5 times, (Md=4, Min=0, Max=12) and 4.8  $\pm$ 1.5 times (Md=5, Min=0, Max=10) in Turkana and Marsabit, respectively. Considering the mean $\pm$ SD age of the children aged 6-23 months of 14.4 $\pm$ 5.3 months, the frequency of under 5 clinics visits was low, and thus needs to be emphasized in future projects.

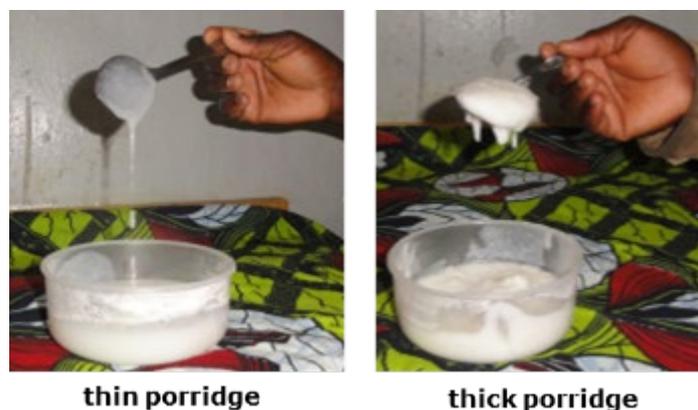
Slightly more than a third of the respondents (36.1%) reported that they took care of their children aged 6-23 months by themselves. The other people who supported the mothers in taking care of their children were the respondents' mothers/ mother-laws (36.1%) and older siblings of the children (14.8%), Table 18. Overall, only 4.9% of the spouses/ other male relatives supported the mothers in taking care of their children (4.0% in Turkana, 5.2% in Marsabit and the spouses/ other male relatives (4.9%).

**Table 18: Supporter in taking care of the child (6-23 months)**

Care taker of the child (%)	Total (N=487)	Turkana (n=125)	Marsabit (n=362)
Respondent alone	36.1	40.8	34.5
Mother/ mother-in-law	36.1	27.2	39.2
Older siblings of child	14.8	20.8	12.7
Spouse/ other male relative	4.9	4.0	5.2
Others	8.0	7.2	8.3

## 4.6. Knowledge, attitudes and practices regarding complementary feeding

During the interview, the respondents were presented with two pictures, one showing watery porridge, and the other thick porridge (Figure 15, Page 33) and asked to choose which porridge they would give to a young. Less than one third (29.2%) mothers chose the thick porridge as the one type they would give their children. While 48.8% of the mothers in Turkana chose thick porridge, only 22.9% chose thick porridge from Marsabit.



**Figure 15: Pictures showing examples of thin and thick porridges**

Respondents were asked to **name some ways that one can make porridge more nutritious/ which foods could be added to maize/ sorghum porridge to make it more nutritious**. Energy rich foods including oils, butter and margarine (95.7%) were the most common foods that mothers said could be used to enrich maize/sorghum porridge followed by animal-source foods (76.0%), and other foods such as sugar and salt (68.4%). The same trend was observed in Turkana and Marsabit. Most respondents were not aware that they could use pulses and nuts, orange (vitamin A rich) fruits and vegetables) and dark green leafy vegetables to make porridge more nutritious (Table 19).

**Table 19: Foods or types of foods to add to porridge to make it more nutritious**

Additions to porridge (%)	Total (N=487)	Turkana (n=125)	Marsabit (n=362)
Animal source foods (meat, poultry, fish, liver/organ meat, eggs, milk etc.)	76.0	86.4	72.4
Pulses and nuts	1.6	5.6	0.3
Orange (vitamin A rich) fruits and vegetables	0.8	2.4	0.3
Dark green leafy vegetables	0.4	5.6	0.6
Energy-rich foods (e.g. butter, oil)	95.7	94.4	96.1
Others (sugar, salt etc)	68.4	38.4	29.3

Most respondents (72.3%) named two types of foods that could be added to maize/ sorghum porridge to make it more nutritious (74.4% in Turkana, 71.5% in Marsabit). The mean number of mentioned types of foods that could be added to maize or sorghum porridge to make it more nutritious was  $1.7 \pm 0.5$  (Md=2, Min=0, Max=3), Annex I page 73. Only 2.3% of the respondents could not name any type foods/ types of foods that could be used to enrich maize/sorghum porridge (0.8% in Turkana, 2.8% in Marsabit).

The respondents were further asked how they could recognize that someone was not eating enough food (signs of malnutrition). Most of the respondents (88.7%) mentioned loss of weight/ thinness, followed by lack of energy/ weakness (68.4%) as signs of malnutrition (Table 20). While loss of weight/ thinness (90.4%), weakness of immune system (88.8%) and lack of energy (84.0%) were mentioned as signs of malnutrition by most respondents in Turkana, loss of weight/ thinness (88.1%) was the main sign of malnutrition mentioned by respondents in Marsabit. Growth faltering, which is the most common sign of malnutrition among infants and young children was only mentioned as a sign of malnutrition by 32.9% of the mothers (59.2% in Turkana, 23.8% in Marsabit).

**Table 20: Mentioned signs of malnutrition**

Signs of malnutrition (%)	Total (N=487)	Turkana (n=125)	Marsabit (n=362)
Lack of energy/ weakness	68.4	84.0	63
Weakness of the immune system	44.4	88.8	29
Loss of weight/ thinness	88.7	90.4	88.1
Growth faltering in children	32.9	59.2	23.8
Others	3.1	5.6	2.2

The respondents mentioned mainly one (38.0%) or two (28.5%) signs of malnutrition. Most of the respondents in Turkana and Marsabit mentioned four (47.2%) and two (46.4%) signs of malnutrition, respectively. Only 2.1% of the respondents could not mention any sign of malnutrition (0.0% in Turkana, 2.8% in Marsabit). The mean number of signs of malnutrition mentioned was  $2.3 \pm 1.0$  (Md=2 Min=0,

Max=4), Annex I page 73. The mean number of signs of malnutrition mentioned by the respondents was slightly higher in Turkana (Mean± SD=3.2±0.9, Md=3, Min=1, Max=4), compared to Marsabit (Mean± SD=2.0±0.8, Md=2, Min=0, Max=4).

The **most common reasons mentioned as to why people are malnourished** were not getting enough food (88.3%) and illness and not eating food (87.9%). Watery food, which does not contain enough nutrients, was mentioned by 22.4% of the respondents as one reason why people are malnourished (53.6% in Turkana, 11.6% in Marsabit (Table 21). The mean number of reasons mentioned by the respondents for people being malnourished was 2.0 (±0.7) (Md=2, Min=0, Max=3), Annex I page 73. More than half of all respondents (65.3%) were able to mention at least two reasons why people are malnourished. While a half of the respondents in Turkana (52.0%) were able to mention three reasons for people being malnourished, 73.5% of respondents mentioned two reasons. Only 2.9% of respondents were not able to mention any reason for malnutrition (0.0% in Turkana, 3.9% in Marsabit).

**Table 21: Reasons why people are malnourished**

Reasons why people are malnourished (%)	Total (N=487)	Turkana (n=125)	Marsabit (n=362)
Not getting enough food	88.3	97.6	85.1
Watery food, not containing enough nutrients	22.4	53.6	11.6
Diseases/ Illness and not eating food	87.9	95.2	85.4
Others	0.3	3.2	1.8

Regarding what could be done to **prevent malnutrition among young children** (6-23 months), a majority of the respondents (86.2%) mentioned giving more food (95.2% in Turkana, 83.1% in Marsabit), followed by giving different types of foods each day (66.7%) and visiting health centre/ hospital for growth monitoring services (53.6%), Table 22. The mean number of ways to prevent malnutrition mentioned by the respondents was 2.6±1.2, Md=2, Min=0, Max=5), Annex I page 73. The mean number of ways to prevent malnutrition mentioned was higher among mothers in Turkana (Mean±SD=3.6±1.3, Md=4, Min=1, Max=5) compared with those from Marsabit (Mean±SD=2.3±1.0, Md=2, Min=0, Max=5). Two and three ways of preventing malnutrition among were mentioned by 34.1% and 28.5% of the respondents, respectively. While 35.2% of the respondents in Turkana mentioned five ways of preventing malnutrition, 40.1% of mothers in Marsabit mentioned only two ways of preventing malnutrition among young children. Only 2.1% of the respondents could not mention any way to prevent malnutrition (0.0% in Turkana, 2.8% in Marsabit).

**Table 22: Mentioned ways to prevent malnutrition among young children 6-23 months**

Prevention of Malnutrition (%)	Total (N=487)	Turkana (n=125)	Marsabit (n=362)
Give more food	86.2	95.2	83.1
Give different types of foods each day	66.7	85.6	60.2
Feed frequently	33.7	59.2	24.9
Give attention during meals	21.1	54.4	9.7
Visit health hospital for growth monitoring services	53.6	68.0	48.6
Others	5.1	8.0	4.1

Child feeding practices during illness was also assessed and respondents asked if the amounts of fluids (including breast milk) and foods<sup>2</sup> they offered their children during episodes of sickness was less, same or more than usual. The results with regards to the amounts of fluids and foods offered to children during sickness are presented in Table 23. More than half, 52.8% and 52.6% of the respondents offered their children much less fluids and foods during sickness, respectively. Only 6.8 and 1.6% of the respondents offered their children about the same and more fluids during sickness, respectively. With regard to the amount of food offered during illness, only 3.5% and 1.6% of the respondents fed their children about the same and more food, respectively.

**Table 23: Amount of fluids and foods offered to children during illness**

Amount of fluids offered during illness (%)	Total (N=474)	Turkana (n=122)	Marsabit (n=352)
Nothing	5.3	11.2	3.3
Much less	52.8	68.8	47.4
Somewhat less	31.4	17.6	36.3
About the same	6.8	2.4	8.3
More	1.6	0.0	2.2
Child never been sick	1.8	0.0	2.5
Amount of foods offered during illness (%)	Total (N=473)	Turkana (n=121)	Marsabit (n=352)
Nothing	19.1	29.0	15.8
Much less	52.6	52.4	52.9
Somewhat less	17.5	17.7	17.5
About the same	3.5	0.0	4.7
More	0.8	0.0	1.1
Child never been sick	1.6	0.0	2.2

## 4.7. Nutrition counselling

The respondents were asked if they had counselling structures for nutrition in their villages. A majority of the respondents (84.0%) did not have counselling structures for nutrition in their villages (71.2% in Turkana, 88.4% in Marsabit). Health workers (14.8%) formed the main nutrition counselling structures in the surveyed villages (24.0% in Turkana, 11.6% in Marsabit), Table 24.

**Table 24: Counselling structure for nutrition in the villages**

Nutrition counselling structure (%)	Total (N=487)	Turkana (n=125)	Marsabit (n=362)
No counselling structure	84.0	71.2	88.4
Health worker	14.8	24.0	11.6
Volunteer group (mother to mother support groups)	1.0	4.0	0
Agricultural extension service (development gents)	0.0	0.0	0
Other	0.2	0.8	0

2 If child already takes food

Three quarters of the respondents (75.6%) reported that they did not receive any nutrition counselling (Table 25). Less than one quarter (21.1%) of the respondents received nutrition counselling from health extension workers/ CHVs, followed by 2.9% from volunteer groups (mother to mother support groups).

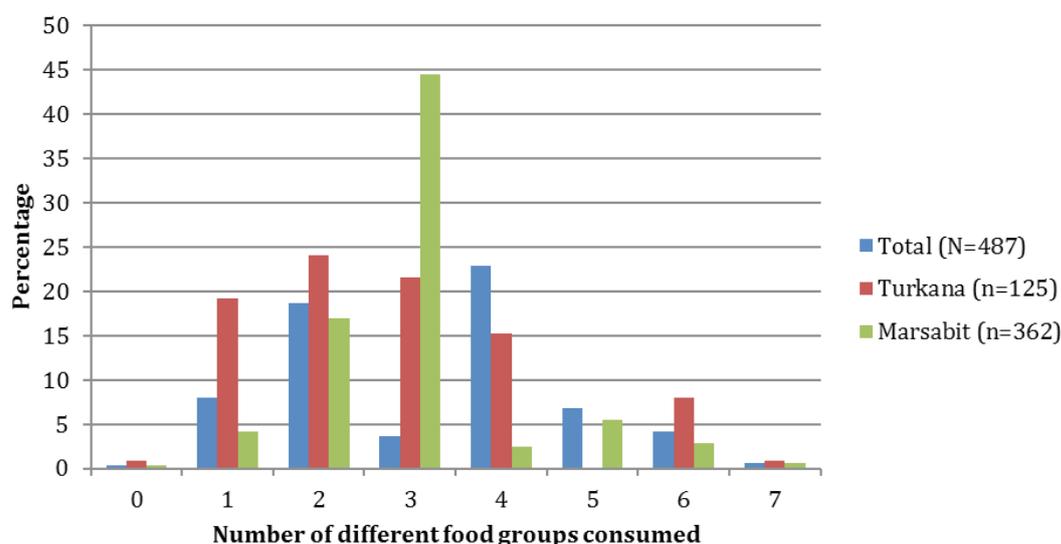
**Table 25: Respondents who received nutrition counselling**

Source of nutrition counselling (%)	Total (N=487)	Turkana (n=125)	Marsabit (n=362)
No counselling received	75.6	56.8	82
Health extension worker/ CHVs	21.1	36.0	16
Volunteer groups (mother to mother support groups)	2.9	6.4	1.7
Agricultural extension service (development agents)	0.0	0.0	0
Others	0.4	0.8	0.3

The respondents were further asked if they had participated in any cooking demonstration in the past six months. **Only 10.5% of the mothers reported had participated in cooking demonstrations** six months prior to the survey (20.8% in Turkana, 6.9% in Marsabit). Overall, nutrition counselling provision to the respondents in the survey area was very low. Hence the need to either integrate nutrition counselling components in the existing or future projects as a way to improve the nutrition knowledge, practices and attitudes of the respondents for improved child nutrition and health.

## 4.8. Dietary diversity of women 15-49 years

**Mean IDDS-W was 3.2 ±1.2** (Md=3, Min=0, Max=7), indicating that the women consumed on average, foods from 3 different food groups the day before the interview (Figure 16). IDDS-W was slightly higher among women in Marsabit (Mean±SD=3.2±1.1, Md=3, Min=0, Max=7), compared with those from Turkana (Mean±SD=3.0±1.6, Md=3, Min=0, Max=7), (Annex J, page 74). The food group score distribution for the women in presented in Annex K, page 74.



**Figure 16: Number of different food groups consumed by women 15-49 years**

The proportion of women consuming foods from different food groups is presented in Figure 17. Nearly all the women (96.3%) in the survey area consumed starchy staple foods (93.6% in Turkana, 97.2% in Marsabit). This was followed by dairy products and beans and peas, which were consumed by 85.4% and 55.9% of the women, respectively. A higher proportion of women in Marsabit compared with those from Turkana consumed dairy products (94.8% vs. 58.4%), beans and peas (59.9% vs. 44.0%) and other vegetables (38.1% vs. 30.4%). Less than twenty percent of the women consumed flesh food (16.0%) and dark green leafy vegetables (15.2%). The consumption of eggs (2.5%), nuts and seeds (1.8%), vitamin A rich fruits and vegetables (3.5%) and other fruits (2.5%) was notably low among the women. The slightly higher IDDS-W in Marsabit could be attributed to the higher proportion of women who consumed beans and nuts, dairy products and other vegetables in Turkana compared with Marsabit. More women consumed dark green leafy vegetables in Turkana (33.6%) than in Marsabit (8.8%).

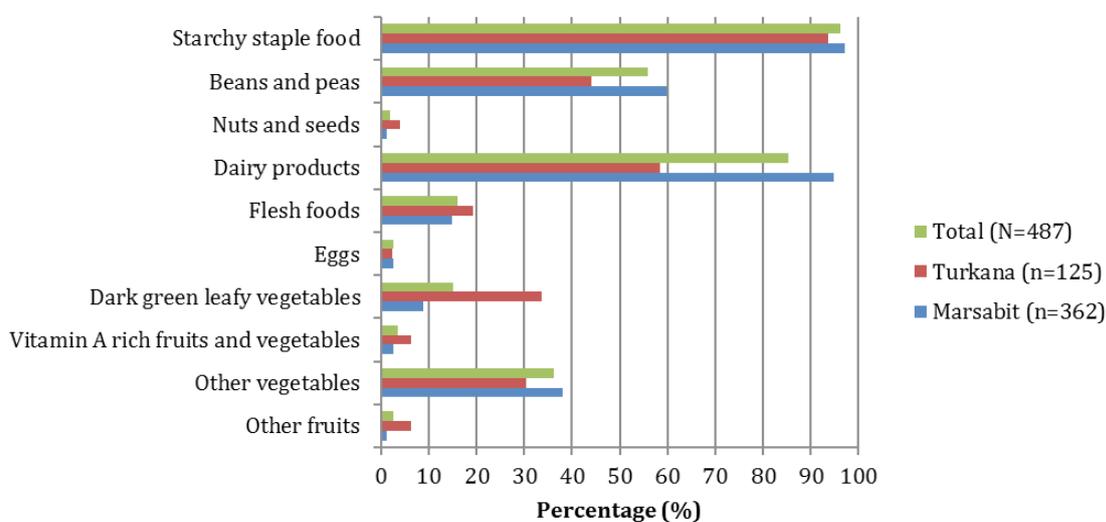


Figure 17: Proportion of women (15-49 years) consuming foods from different food groups

### Minimum Dietary Diversity - Women

According to FAO and FANTA (2014), women need to consume foods from at least five out of the recommended ten food groups per day in order to achieve minimum dietary diversity-women (MDD-W). **The prevalence of women who achieved MDD-W was only 11.5%** (Annex L page 74). More women achieved MDD-W in Turkana (19.2%) compared with Marsabit (8.8%). This low prevalence of MDD-W could be attributed to consumption of foods from only a few food groups, which could in the long run contribute to inadequate nutrient intake among the women. Hence the need for measures to promote the consumption of a variety of foods, especially the ASF, nuts and seeds, vitamin A rich fruits and vegetables and other fruits.

## 4.9. Information on children aged 6-23 months

The mean±SD age (months) of the children was 14.4 ±5.3, Md=15.0, Min=6.0, Max=24.0). The mean age of the children was slightly higher in Marsabit (Mean±SD=14.6 ±5.1, Md=15.0, Min=6.0, Max=24.0), compared with Turkana (Mean±SD=13.9 ±5.7, Md=13.5, Min=6.0, Max=23.0). The distribution of the children with regards to sex was comparable, with 49.9% being male and 50.1% being female. The same phenomenon was observed in Turkana and Marsabit whereby a half of the surveyed children were either male or female.

## Dietary diversity of children aged 6-23 months

Respondents were asked if their children had ever been breastfed, when they first gave their children other foods apart from breast milk, and whether the children had consumed any breast milk during the day or night the day prior to the interview. **Nearly all children (99.2%) had ever been breastfed (97.6% in Turkana, 99.7% in Marsabit).** At the time of the survey, 82.3% of the children (79.2% in Turkana, 83.4% in Marsabit) were still being breastfed. The mean age (months) when the children were first given other foods apart from breast milk was  $5.4 \pm 2.3$  (Md=6, Min=0, Max=12). The mean age when complementary foods were first given to the children was lower in Marsabit (Mean $\pm$ SD=5.2 $\pm$ 2.3, Md=6, Min=0, Max=12), compared with Turkana (Mean $\pm$ SD=6.2 $\pm$ 1.9, Md=6, Min=1, Max=12). **Overall, 59.8% of the children were introduced to other foods at the recommended age of six months (61.7% in Turkana, 59.1% in Marsabit).** Nearly one third of the children (24.8%) were introduced to other foods before the age of six months (17.5% in Turkana, 27.2% in Marsabit), while 15.5% started receiving complementary foods after the age of six months (20.8% in Turkana, 13.7% in Marsabit). Five children (1.0%) were reported not to have started consuming other foods or liquids apart from breast milk.

The WHO recommends disaggregation and reporting of IYCF indicators for children for the age groups 6-11 months, 12-17 months and 18-23 months (WHO 2007). Overall, the prevalence of breastfeeding was highest among the children aged 6-11 months (96.2%) and lowest among those aged 18-23 months (64.3%). The WHO recommends continued breastfeeding even with the introduction of complementary foods until the age of two years (WHO 2001), which was therefore only met by one-third of children in the oldest age group (Table 26).

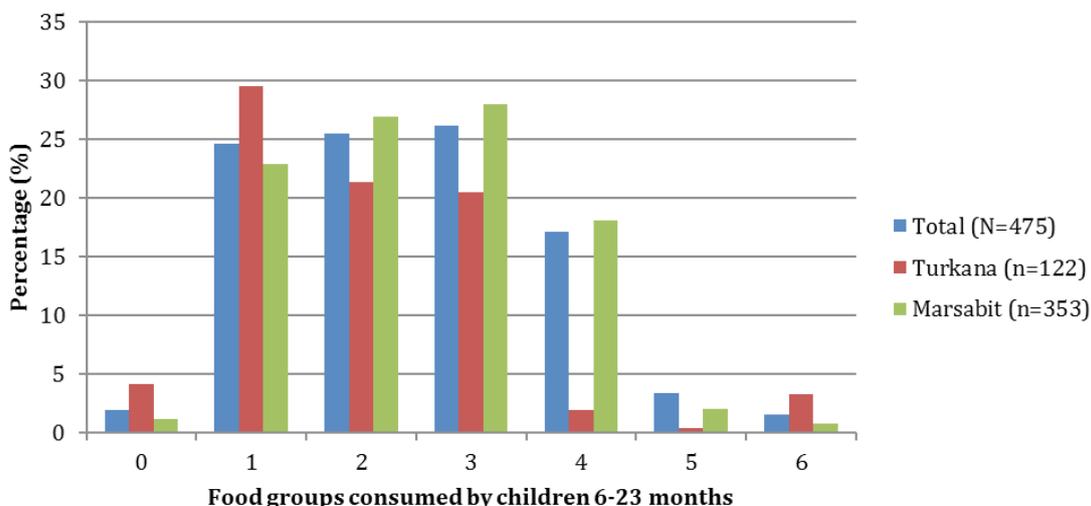
**Table 26: Prevalence of breastfed children disaggregated into WHO age-groups**

Children being breastfed (%)	Total (N=475)	Turkana (n=122)	Marsabit (n=353)
<b>6-11 months</b> (n=156)	96.2	96.0	96.2
<b>12-17 months</b> (n=162)	87.0	75.9	89.5
<b>18-23 months</b> (n=157)	64.3	62.8	64.9

## Individual Dietary Diversity Score-Children

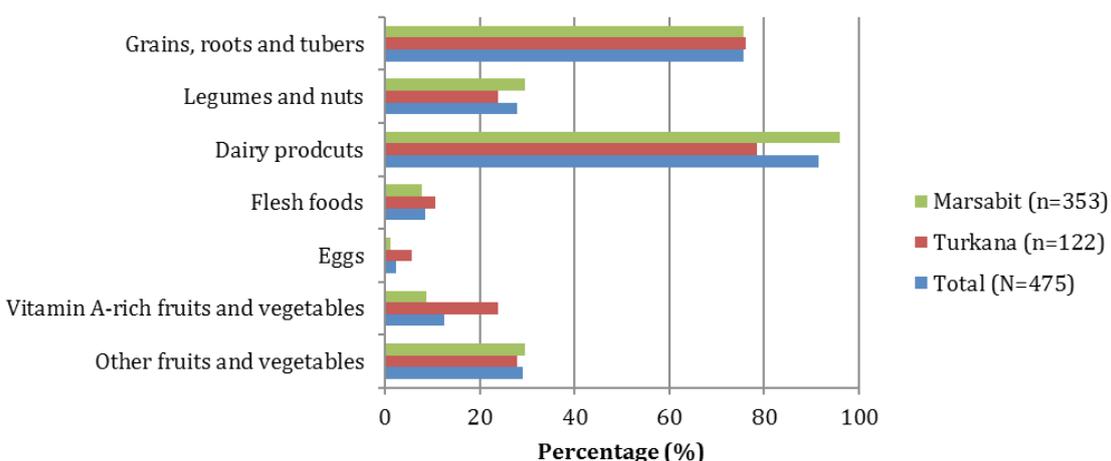
**The mean  $\pm$ SD IDDS for the children 6-23 months was 2.5  $\pm$ 1.3** (Md=2, Min=0, Max=6). Mean IDDS-C was similar among children in both Turkana (2.5 $\pm$ 1.5) and Marsabit (2.5 $\pm$ 1.2) (Annex N, page 74). Results with regards to IDDS-C disaggregated according to breastfeeding status, showed that mean IDDS-C was lower among breastfed children (2.3 $\pm$ 1.2), compared to those not breastfed (3.1  $\pm$ 1.2), (Annexes O and P, page 75).

The distribution of IDDS-C among the children aged 6-23 months is presented in Figure 18 (Page 40). The proportion of children 6-23 months who consumed foods from  $\geq 4$  more food groups was overall low in the survey area.



**Figure 18: Distribution of IDDS-C and proportion of children who received minimum dietary diversity**

Figure 19 shows the proportion of children 6-23 months who consumed foods from different food groups the day preceding the survey. A majority of the children (91.6%) consumed dairy products, (78.5% in Turkana, 96.0% in Marsabit), followed by 75.8% who consumed grains, roots and tubers (76.2% in Turkana, 75.6% in Marsabit). Less than one third of the children (28.0%) consumed pulses and nuts and other fruits and vegetables (29.1%). Vitamin A rich fruits and vegetables were consumed by 12.6% of the children, with a higher proportion of them from Turkana (23.8%) compared with Marsabit (8.8%). Except for dairy products, only a small proportion of children consumed other ASF including flesh foods (8.6%) and eggs (2.3%). The different food group consumed by the children disaggregated into sub-counties is presented in Annex Q (page 75).



**Figure 19: Proportion of children 6-23 months consuming foods from different food groups**

### Minimum Dietary Diversity

**Less than a quarter of all children (21.9%) received minimum dietary diversity** by consuming foods from  $\geq 4$  out of 7 food groups the day before the interview. The percentage of children who received MDD was slightly higher in Turkana (24.6%) compared with Marsabit (21.0%), Table 27. A higher proportion of non-breastfed children (36.1%) received MDD compared to the breastfed children (18.9%).

### Minimum Meal Frequency

The respondents reported that 84.4% of the children had received some kind of food apart from breast milk during the previous 24 hours. Mean  $\pm$  SD feeding frequency for all children 6-23 months was  $3.2 \pm 1.3$  times during the last 24 hours (N=410, Md=3, Min=0, Max=7) (Annex M, page 74). **The proportion of children who received food the minimum number of times or more the day preceding the survey was 71.4%**, Table 27. With regards to breastfeeding status, 71.9% of breastfed and 69.0% of non-breastfed children received MMF. The percentage of breastfed children (77.6%) who received MMF was higher compared to the non-breastfed children (56.0%) in Turkana. On the other hand, a slightly higher proportion of non-breastfed children in Marsabit (74.6%) received MMF compared to the breastfed children (70.0%).

### Minimum Acceptable Diet

The MAD is a composite indicator calculated from the fractions: breastfed children who had at least the MDD and age appropriate MMF during the previous day; and non-breastfed children 6-23 months of age who received at least two milk feeds and had at least the MDD not including milk feeds and MMF the previous day (WHO 2010). **Overall, only 14.9% of the children received MAD**, Table 27. The prevalence of children who received MAD was higher for the breastfed (17.7%) compared with the non-breastfed (3.6%) children. Further, the percentage of children 6-23 months who achieved MAD was higher in Turkana (20.2%) compared with Marsabit (13.0%), and higher among breastfed children compared with the non-breastfed children, Table 27.

**Table 27: Percentage of children 6-23 months who achieved MMF, MDD, and MAD**

YCF indicators (%)	Total (N=475)	Turkana (n=122)	Marsabit (n=353)
<b>Minimum dietary diversity (MDD)</b>	21.9	24.6	21
Breastfed (n=392)	18.9	22.7	17.6
Non-breastfed (n=83)	36.1	32	37.9
<b>Minimum meal frequency (MMF)</b>	71.4	72.7	70.9
Breastfed (n=335)	71.9	77.6	70
Non-breastfed (n=84)	69	56	74.6
<b>Minimum acceptable diet (MAD)</b>	14.9	20.2	13.0
Breastfed (n=333)	17.7	23.8	15.7
Non-breastfed (n=83)	3.6	8.0	1.7

Further analysis was performed disaggregating the YCF indicators according to children in the age groups 6-11, 12-17 and 18-23 months. The results showed that while the **prevalence of MDD was lowest among children aged 6-11 months (10.3%) and highest among children aged 18-23 months (29.9%)**, indicating that children tended to consume more diversified diets with increasing age. **The prevalence of MMF was also highest (80.5%) among children aged 6-11 months**. However, the low MDD among children aged 6-11 months resulted in them having an overall low MAD (11.0%), Table 28 (Page 43). **The prevalence of MAD was highest among children aged 18-23 months (16.8%)**, followed

by 16.1% among children aged 12-17 months. This is due to the fact that the children in these two age groups had higher MDD and MMF.

The disaggregated information with regards to the IYCF indicators MDD, MMF and MAD demonstrates that the age of a child is an important factor influencing child feeding practices, and consequently the achievement of IYCF indicators. Therefore, in order to increase the proportion of children achieving MAD, there is need to ensure age appropriate child feeding practices with regards to MDD and MMF especially among children aged 6-12 and 18-23 months. The low prevalence of MAD among children in all the three age groups provides an overall indication of diets low in diversity and nutrient adequacy among children 6-23 months in the target population.

**Table 28: IYCF Indicators disaggregated into age groups**

IYCF Indicator (%)	Total (N=475)	Turkana (n=122)	Marsabit (n=362)
<b>6-11 months (n=156)</b>			
MDD	10.3 (n=156)	16.0 (n=50)	7.5 (n=106)
MMF	80.5 (n=118)	82.9 (n=41)	79.2 (n=77)
MAD	11.0 (n=118)	17.1 (n=41)	7.8 (n=77)
<b>12-17 months (n=162)</b>			
MDD	25.3 (n=162)	27.6 (n=29)	24.8 (n=133)
MMF	67.8 (n=149)	66.7 (n=27)	68.0 (n=122)
MAD	16.1 (n=149)	14.8 (n=27)	16.4 (n=122)
<b>18-23 months (n=157)</b>			
MDD	29.9 (n=157)	32.6 (n=43)	28.9 (n=114)
MMF	67.8 (n=143)	65.5 (n=40)	68.0 (n=103)
MAD	16.8(n=143)	25.0 (n=40)	13.6 (n=103)

The respondents were asked if the food intake of the index child had been different from usual the day preceding the survey. The food intake of 21.9% of the children was reported to have been unusual the previous day (26.2% in Turkana, 20.5% in Marsabit).



## 5. CONCLUSIONS AND RECOMMENDATIONS

The current nutrition baseline survey, which was conducted between January and February 2016, described the food and nutrition security situation of households in Turkana and Marsabit Counties which are located in northern Kenya. The conclusions and 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 in counties and sub-counties as well) for monitoring and evaluation (M&E) activities and planning.

A general assumption is that the project area has two main livelihood zones: agro-pastoral (mainly in Saku, Moyale and Kibish) and pastoral (mainly in Turkana South, Laisamis, North Horr). These should be taken into account and discussed further with the partners since they need different intervention strategies concerning food and nutrition security, nutrition sensitive agriculture and/or food security (increase of income/ or access to food). The main conclusions and recommendations are outlined below. It is recommended to work together with experts who have experience in food security in pastoral livelihoods and opportunities of livelihood change – for households that would like to change their livelihoods.

Main conclusions	Main recommendations
<p>Household food insecurity status:</p> <p>Only 5.6% of households were food secure (2.5% in Turkana, 6.6% in Marsabit). Severe food insecurity was experienced by 69.8% of the households (89.1% in Turkana, 63.4% in Marsabit). The high prevalence of severe food insecurity could be attributed to the fact that both Turkana and Marsabit Sub-Counties lie in the arid and semi-arid lands (ASAL), which are characterized by hot and dry weather, with erratic and unpredictable rainfall patterns. Food insecurity could also be attributed to low access to arable land that can be used for agriculture since most of the land is owned communally. Thus, agricultural production remains a challenge for most households in the survey area, with pastoral being the main source of livelihoods in the survey area.</p>	<p>There is need to promote other livelihoods in addition to pastoral as a means of ensuring household food security during all seasons of the years. These include agro-pastoral especially in regions under irrigation, fishing along Lake Turkana in addition to increased opportunities for business and employment in the counties.</p> <p>Need to investigate and understand the underlying factors contributing to food insecurity in the survey areas including the dependence on pastoral, low crop diversity (production) and reliance only on a subset of foods (mainly maize), lack and/or low income levels especially among women, high food prices and poor access to a variety of foods from markets, cultural practices, habits and taboos related to food production and consumption etc.</p> <p>In order to help household to cope during periods severe food insecurity (especially during the lean season), affected households should be enrolled in social and/or cash transfers programmes, to help them have access to a variety of foods during the lean seasons.</p> <p>Regular monitoring and evaluation of the levels of food insecurity throughout the project area (quarterly per year), could act as an early warning system is recommended as part of the monitoring and evaluating the food security situation in region.</p>
<p><b>Concerning the immediate causes of malnutrition.</b></p> <p><b>Infant and young child feeding practices:</b></p> <p>Only 21.9% of the children aged 6-23 months achieved minimum dietary diversity (MDD) i.e. consumed foods from ≥4 food groups out of seven food groups. On average, the children consumed foods from three food groups (mainly from dairy products, grains, roots and tubers, and other fruits and vegetables). Except for dairy products, the consumption of other ASF including flesh foods and eggs was notably low among the children. The prevalence of children 6-23 months who achieved minimum dietary diversity (MDD) was 21.9%, while 71.4% of the children received minimum meal frequency (MMF). Less than a fifth of the children (14.9%) achieved minimum acceptable diet (MAD), which was lower than national average of 21% (KDHS 2014). This low prevalence of children 6-23 months consuming acceptable diets needs to be addressed since it is one of the factors contributing to poor nutritional and health status among infants and young children.</p> <p><b>Dietary diversity of women:</b> Overall, the women consumed foods from three food groups (mainly "starchy staples", "dairy products", and "beans and peas"). Nuts and seeds, eggs, vitamin A rich fruits and vegetables and other fruits and vegetables were the least consumed foods. Less than twenty percent (11.5%) of the women consumed foods from ≥5 foods groups. The relatively low dietary diversity of women could be attributed to poor access to a variety of foods and in addition to inadequate nutrition knowledge among the women on the importance of consuming a variety of foods.</p> <p>Dairy products were consumed by a high proportion of children 6-23 months and also the women. This could be explained by the fact that milk was locally available and easily accessible as most of the household reared animals. The consumption of flesh meats and eggs was low among both the children 6-23 months and the women. While eggs are recognized for their nutritional value, ease of preparation and also consumption, their consumption among both the children and women was low. This could be explained by the fact that poultry rearing is not a common in the survey areas.</p> <p>A comparison of mean dietary diversity scores for the children and women disaggregated in terms of household food insecurity categories showed that mean dietary diversity scores in both target groups were highest amongst food secure households (Table 29).</p>	<p>There is need for nutrition education strategies to improve the overall dietary intake and diversity of children 6-23 months and women of reproductive age in the study areas.</p> <p>Measures to increase the proportion of children receiving especially MDD as a way of ensuring that they also achieve MAD need to consider the age of the children:</p> <p>Children 6-11 months have the lowest MDD rates, but the highest MMF. Therefore, there is need for interventions to promote the consumption of a variety of foods starting early during the complementary period in order to ensure that young infants and children 6-23 months consume acceptable diets.</p> <p>Feeding frequency needs to be increased among children 18-23 months of age, as a way to ensure that they achieve MAD. .</p> <p><b>Increase consumption of a variety of fruits and vegetables</b> including the vitamin A-rich fruit and vegetables and dark green leafy vegetables:</p> <p>Improve diet of children under two by providing information regarding the nutritional benefits and value of vitamin A-rich fruit and vegetables especially dark green leafy vegetables</p> <p><b>Increase consumption of flesh meats and eggs:</b></p> <p>Need for interventions to address barriers affecting the consumption flesh foods and eggs among both women and children.</p> <p>Integrated nutrition education and agricultural interventions promoting the rearing of small animals and consumption of a variety of animal source foods are needed.</p> <p><b>Monitoring:</b> Since the prevalence of household food insecurity is likely to increase during the lean season, regular assessment of HFIES and dietary diversity of women and children are recommended.</p>
<p><b>Health status</b></p> <p>The severity of shortcomings regarding the WASH sector is reflected in the <b>high prevalence and frequency of diarrhoea</b> among infants and young children. More than one third (36.6%) of children under two years of age were reported to have suffered from diarrhoea two weeks prior to the survey. The mean number of times that the children were reported to have had diarrhoea in the previous six months was 2.6± 3.7. The occurrence of diarrhoea among infants and young children in this population could be attributed to several underlying factors, including inappropriate sanitation and hygiene practices, which need to be addressed.</p>	<p><b>Activities</b></p> <p>Identification and addressing the main factors that are likely to contribute to diarrheal infection such as inadequate access to improved sanitation facilities, unprotected water sources and unhygienic practices.</p> <p>Hygiene counselling, implication of health promoters at village level).</p> <p>Promotion of different methods of treating drinking water to make it safe.</p> <p>Need to develop and disseminate nutrition and hygiene messages through local health structures and also by communicating the same messages regularly to caregivers.</p> <p>Integration of hygiene counselling into the regular nutrition counselling structures</p>

Main conclusions	Main recommendations
<p><b>Agriculture and food production:</b></p> <p><b>Only 21.1% (n=103) of the surveyed households has access to arable land that could be used for agriculture (29.6 in Turkana, 18.2 in Marsabit).</b></p> <p><b>Crop diversity</b> was low with most households producing an average of two crops during the previous cultivation season in both Turkana and Marsabit. Maize was the main crop grown by most of the households (88.3%), followed by legumes (73.8%), sorghum (13.6%) and miraa (13.6%). A higher proportion of households in Marsabit compared to Turkana grew legumes (86.5% vs. 51.4%). Sorghum was produced mainly by households in Turkana, unlike in Marsabit. The production of other staple foods including finger millet, cassava, sweet potatoes and green bananas was notably low (&lt;5%).</p> <p>Maize was considered the most important crop (one that brought in the most income) by approximately a half (48.5%) of the households who reported to cultivate crops, followed by legumes (11.5%). Other important crops included miraa and sorghum.</p> <p><b>Home gardens</b> are used for growing fruits and vegetables, mainly for home consumption as well as for income generation, diet diversification and also for ensuring household food security. <b>Ownership of home gardens was notably low (8%, n=39)</b> among households in the survey area. Home gardens were mainly used for vegetable production mainly during the wet/ rainy season (69.2%). While most households (93.5%) produced sukuma wiki in home gardens in Marsabit, a high proportion of household in Turkana (88.2%) grew cow pea leaves. The vegetables produced (from the home gardens and other places) were mainly used for own consumption (66.2%).</p> <p>Consumption of fruits was low among the survey population with only 7.8% (n=38) of households growing or having access to fruit trees (12.0% in Turkana, 6.4% in Marsabit). Water melons (66.7%) and wild fruits (53.3%) were mainly grown/accessible to households in Turkana, while papaya (62.2%), mangoes (47.3%) and bananas (39.1%) were grown/accessible to a higher proportion of households in Marsabit.</p> <p>Animal rearing was main livelihood for more than three quarters of the households (<b>78.4%</b>) surveyed (71.2% in Turkana, 80.9% in Marsabit). The animals reared were mainly for sale and own consumption (52.6%).</p> <p>Live animals (80.5%), milk (30.2%), and meat (20.6%) were the main animal products sold by households. A higher proportion of households in Marsabit (80.3%) sold live animals compared with 67.8% in Turkana. While other animal products sold included poultry (14.4%) and eggs (17.9%), the consumption of eggs was notably low among children 6-23 months and women of reproductive age in the survey area.</p>	<p>The project has only a low potential to invest in nutrition sensitive agriculture since only a few households have access to land as well as own home gardens. However, most of the available arable is very rocky, and is used for crop production mainly during the rainy season after being ploughed with the help of cattle and donkeys.</p> <p><b>Activities</b></p> <p>The <b>rearing of small animals/livestock</b> such as poultry as a way to increase the availability and consumption of a variety of ASF such as flesh and eggs at household level needs to be promoted. There is also need to identify and address the barriers to consumption of other animal source foods especially eggs among infants and young children 6-23 during the complementary feeding period.</p> <p>Increasing <b>food availability at household level by increasing the access of households to arable land</b> which can be used for crop production.</p> <p>Increasing crop production by establishing irrigation schemes especially for production of fruits and vegetables.</p> <p>Enhancing crop diversity by <b>promoting the cultivation of drought resistant crops adapted to the climatic conditions including cassava, sweet potatoes, finger millet</b> in order to enhance not only crop diversity, but also dietary diversity.</p> <p><b>Nutrition education</b> strategies for dietary diversification are needed as a means of promoting the consumption of a variety of foods, especially the vegetables and fruits not only for infants and young children, but for all household members.</p> <p>Nutrition education interventions need to be integrated with other strategies such as agricultural activities to increase the production of a variety of foods, especially the vegetables and fruits. This would go a long way in improving the overall crop diversity.</p> <p>Increasing food availability at household level by <b>encouraging households to establish home gardens</b>. Further, strategies are needed to identify and address the barriers or factors hindering households from establishing home gardens and growing a variety of vegetables during both the dry and hot seasons. Increasing the number of water sources that can be used for irrigation purposes could contribute to increased availability and accessibility to a variety of vegetables throughout all seasons. Households should also be taught different food processing and preservation methods to preserve and minimize food losses (especially of surplus vegetables and fruits) to ensure food availability during lean seasons.</p>
<p><b>Access to food</b> (income, infrastructure and access to markets)</p> <p><b>Main sources of income</b> throughout the previous year included sale of animals or animal products (58.5%), followed by casual labour/temporary salary (24.2%) and sale of own produced crafts or gathered goods (20.5%). Only 5.7% of the surveyed households had a regular salary, while the sale of own produced crops was a source of income for 10.5% of the households. Sale of own animals or animal products (66%) was the main source of income for households in Turkana, while more households in Turkana generated their income from the sale of own produced or gathered goods (58.5%). On average, households depended on 2 different sources of income</p> <p>Access to food aid (22%), cash transfer (30.6%), and food for assets/work (11.9%) was limited in the survey areas. However, more than half the households (60%) benefitted from school feeding programs. Only 6.2% of the household participated in agricultural development programs.</p>	<p><b>Activities</b></p> <p>To <b>provide opportunities for diverse income sources</b> including increasing the diversity of crops grown, increasing opportunities for production and sale of crafts and other gathered goods (market access, cash transfer) to buy more and diverse food.</p> <p><b>Improve access to food assistance programs</b> in the region especially for severely food insecure households. Food aid programs including the distribution of dry rations to households should only be discussed in case of emergencies.</p> <p>Avoid a conflict between generating income by selling versus consumption for nutritional benefits especially for pulses and animal source foods through increased production of these foods. Elaborate a strategy with local agricultural extension staff.</p> <p>Nevertheless, high quality food items should be also promoted for usage in meals by transferring the benefits and additional nutritional value to specific household members (especially the nutritional value of flesh foods for children).</p> <p>Local fares to showcase the crops produced and demonstrate the various food preservation methods to women groups, young farmers groups at village level could have a positive effect on the production and consumption of a variety of foods.</p>

Main conclusions	Main recommendations
<p><b>Care behaviour</b></p> <p>Higher education is associated with improved dietary intakes and better nutritional status among infants and young children. The <b>literacy levels were generally low among the women</b> with a majority of them (78.6%) having some primary education and less than 5% having more than secondary education.</p> <p>Most of the respondents (84.0%) did not have <b>nutrition counselling structure in their villages. Most of the respondents (75.6%) had never received any nutrition counselling. In addition 61.1% of the respondents reported not having received any hygiene counselling.</b></p> <p><b>The mothers (36.1%) and grandmothers (36.1%) were the main caregivers of the children aged 6-23 months. The other caregivers</b> included older siblings of the children (14.8%) and spouse or other male relative (4.9%). Other family members especially grandmothers and spouses have been shown to have a great influence on child care and feeding practices (Aubel 2012).</p> <p>Infants and young children should be exclusively breastfed for the first six months life and then gradually introduced to nutritious complementary foods with continued breastfeeding up to two years (WHO 2001, WHO 2007). Almost all children (99.2%) had ever been breastfed (97.6% in Turkana, 99.7% in Marsabit), and most of them (82.3%) were still being breastfed (79.2% in Turkana, 83.4% in Marsabit). Breastfeeding rate was highest among children in the age group 6-11 months (96.2%) and lowest among those aged 18-23 months (64.3%).</p> <p><b>Inappropriate child feeding practices is one major factor contributing to inadequate nutrient intake among infants and young children during the complementary feeding period. The level of nutrition knowledge among the mothers was assessed by asking them a set of questions related to child feeding practices:</b></p> <p>While watery porridge has less nutrients, it was considered to be appropriate for feeding infants and young children aged 6-12 months by 69.0% of the mothers (51.0% in Turkana, 77.1% in Marsabit). Knowledge about enriching foods for infants and young children was also assessed and found to be limited among the mothers. Addition of energy rich foods (95.7%), followed by animal source foods (76%) and other foods including sugar and salt (68.4%) were the common foods mentioned by the respondents that could be used to enrich maize/sorghum porridge. On average, the respondents mentioned 2 methods of enriching maize/ sorghum porridge. The use of pulses and nuts, orange-fleshed fruits and vegetables, and dark green leafy vegetables in enriching maize porridge were mentioned by only 1.6%, 0.8%, and 0.4% of the women, respectively. This demonstrates the low levels of nutrition knowledge among the respondents with regard to the different methods of enriching complementary foods.</p> <p>Adequate nutrient intake is important even during sickness as it promotes quick recovery among infants and young children. Nevertheless, <b>child feeding practices during episodes of illness was found to be inappropriate</b> with more than a half of the respondents (52.8%) offering <b>less fluids and less food (52.6%)</b> to their children during sickness. This low intake of nutrients during illness is of great concern as it contributes to worsening nutritional status and slow recovery from illnesses, hence the need to be addressed.</p> <p><b>The respondent's knowledge about the causes, symptoms and ways of preventing malnutrition was also assessed and found to be very limited.</b> Loss of weight/thinness (88.7%) and lack of energy/ weakness (68.4%) were the most common signs of malnutrition mentioned by the respondents. Growth faltering which is the most common sign of malnutrition among infants and young children was mentioned as a sign of malnutrition by one third (32.9%) of respondents. On average, the respondents knew two signs of malnutrition.</p> <p>Not eating enough food (88.3%) and presence of diseases/ illnesses (87.9%) were the main reasons mentioned by the respondents for people being malnourished. <b>Less than one quarter of respondents (22.4%) mentioned that malnutrition can be caused by consuming food that is watery and that does not contain enough nutrients.</b></p> <p>With regards to what could be done to prevent malnutrition among young children, most of the respondents mentioned giving more food (86.2%) and <b>giving different types of foods each day (66.7%)</b>. Going to the health centre/ hospital and checking that the children are growing well was mentioned by 53.6% of the respondents as a way of preventing malnutrition among children aged 6-23 months.</p>	<p><b>Activities</b></p> <p>Increasing the school enrolment, retention and transition for women needs to be promoted. This is because higher education among caregivers has been shown to have a positive effect on nutritional status of young children, and even other household members.</p> <p>Need to include grandmothers in nutrition education and counselling services at community level since they are important in providing a supportive environment during child care and feeding practices.</p> <p>Including both the women and their spouses, as well as grandmothers in nutrition education sessions that include cooking demonstrations aimed at teaching caregivers:</p> <p>the importance of age-appropriate complementary feeding practices including timely introduction of complementary foods, meal frequency and quantities of food to feed and appropriate food consistency.</p> <p>importance of feeding young children a variety of foods including vegetables and fruits and animal source foods during the complementary feeding period</p> <p>Using locally available foods that are easily accessible and affordable to enrich and improve the children's dietary diversity.</p> <p>nutritional value and benefit of the available foods (e.g. green leafy vegetables, pulses, ripe mangoes, orange flesh sweet potatoes)</p> <p>Promotion of continued breastfeeding even after the introduction of other foods into the diets of children at six months and up to two years and beyond. This would help to fill the energy and nutrient gaps from inadequate complementary foods.</p> <p><b>Monitoring</b></p> <p>For monitoring purposes, it is recommended to consider the following KAP areas concerning the nutritional knowledge of women</p> <ul style="list-style-type: none"> <li>- improve nutritional value of porridge</li> <li>- recognize malnutrition</li> <li>- reasons for malnutrition</li> <li>- prevention of malnutrition</li> <li>- feeding behavior during illness</li> </ul> <p><b>Monitoring at individual level</b></p> <p><b>KAP survey</b> with sub-sample (1 village randomly selected per Camp) of actual program participants to measure direct program impact. Knowledge levels and behaviour of direct beneficiaries of the project should be assessed before they enrol in the program and after they have attended the program (sub-sample <b>pre- and post-knowledge test</b>)</p> <p><b>Key-informant interviews</b> to assess barriers of behaviour change (sub-sample)</p> <p>Attendance of program should carefully be recorded for each participant including information of location (village) and sessions attended (information can be linked with knowledge test)</p> <p>Monitoring at institutional level</p> <p>Knowledge levels of direct beneficiaries of the project should be assessed before they enrol in the program and after they have attended the program (sub-sample pre- and post-knowledge test)</p> <p>Monitoring training of multipliers:</p> <ul style="list-style-type: none"> <li>assess knowledge of multipliers before and after training</li> <li>establish feed-back and support structure for multipliers during implementation</li> <li>encourage regular refresher trainings for multipliers</li> </ul>

Main conclusions	Main recommendations
<p><b>Water, sanitation and hygiene:</b></p> <p>More than half of the households (54.6%) used drinking water from unprotected water sources during the rainy/wet season (8.8% in Turkana, 70.4% in Marsabit). On the contrary, most households (76.8%) had access to improved/ protected water sources during the dry/hot season (91.2% in Turkana, 71.8% in Marsabit).</p> <p>Most of the surveyed households (71.5%) did not have access to improved sanitation facilities (80.0% in Turkana, 68.5% in Marsabit). Most of the households (75.8%) used unimproved toilet facilities (84.8% in Turkana, 72.7% in Marsabit)</p> <p>More than one half of households (61.4%) had soap. However, most the respondents (87.1%) reported using the soap mainly for washing their bodies, hair, clothes, dishes and pots, and cleaning the house. While most of the respondents (83.3%) used soap while washing hands, most of them (66.9%) washed their hands in a bowl of water shared with other people (41.6% in Turkana, 75.7% in Marsabit). Only 2.3% of respondents washed their hands under running water (1.6 in Turkana, 2.5% in Marsabit).</p>	<p><b>Activities</b></p> <p>Need to increase access to improved sanitation facilities by increasing the toilet facilities coverage at household levels.</p> <p>Increasing access of households to improved and safe water sources during all seasons and sensitizing the households on the importance of treating drinking water to make it safe during cooking demonstrations or any other community activities.</p> <p><b>Monitoring</b></p> <p>It is recommended to apply the following KAP areas concerning the hygiene knowledge of women</p> <ul style="list-style-type: none"> <li>- storage of water in households</li> <li>- ways to make water safer to drink</li> <li>- use of soap</li> <li>- steps of hand-washing</li> <li>- avoid food poisoning</li> </ul>
<p><b>Access to health care</b></p> <p>Most children attended basic health service (under 5 clinic) <b>irregularly</b></p> <p>The women attended an average of 3 antenatal care visits out of the recommended 4 times during their last pregnancy. Further, most of the children were taken to the under-five clinics for an average of five times.</p>	<p><b>Activities</b></p> <p>Promote the use of community health workers who in many cases are the only link between the pregnant women, and the caregivers of infants and young children, and health facilities in the community.</p> <p>Identification of barriers that prevent mothers with their children and pregnant women to attend basic health service regularly</p> <p><b>Monitoring</b></p> <p>Antenatal care visits in project area</p> <p>Growth monitoring visit</p>

**Table 29: Mean food group score at different levels of food insecurity (HFIES)**

Food Group Score Mean (SD)	Household Food Insecurity Experience Scale			
	Food secure	Mild food insecure	Moderate food insecure	Severe food insecure
Women	4.7 (±1.0)	3.8 (±1.0)	3.4 (±1.0)	2.9 (±1.2)
Children 6-23 months	3.1 (±1.7)	2.8 (±1.3)	2.8 (±1.3)	2.3 (±1.2)

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## ANNEXES

### A: List of sampled villages in Turkana and Marsabit Counties

County	Sub-County		Villages	
Turkana	Turkana South	Katilu	Natabosakwa	
			Alumium	
			IDP	
			Namibia	
			Kagete	
			Shanti B	
		Lokichar	IDP	
			EGC village	
			Nachola	
			Lomokamar	
			Nginokakim	
			Kapoo	
		Turkana North	Kibish	Nakapelewoi
				Kangitulai
				Nakinomet
	Central			
	Ekooopus			
	Maendeleo 1			
	Maendeleo 2			
		Laitanit		
Marsabit	Saku	Dakabaricha	Upper Duro Gite	
			Arero Fayo	
			Oda Darba	
				Abdulahi Omar
			Sagante	Ilman Duresa
				Guyo Arero
				GuyoTendekee
				Ilman Dambi
				Jirime

			Lower Segel
			Olla Barako
		Mansille	Ali Issako
	Moyale	Guyo Timo	Halchiso
		Goromuda	Ali Abdi
			Mohammed Boru
			Mohammed Kaldo
		Dabel	Masjida
			Doqe
			Shauri Yako
			Baqata
		Teso	Qulqule
			Teso
			Qilta
			El-Raya
	Laisamis/ Loiyangalani	Korr	Kapina 1
			Ogorjebo
			Nolaso
			Nabo
		Moite	Shauri yako 2
		Laisamis	Odhola
			Barrier
			Letaleyo
		Ngurumit	Munand
			Maragi
			Marti Dorop
			Lukumai
		South Horr	Merimeji 1
			Merimeji 2
			Gorle Town
			Eastleigh 4
		Kamboje	Mugur
			California
			Chief
			Choo
	North Horr	Folore	Gandile/Elema iya/otanda
			Woyam
			Qurqur
			Yaagara New
		Shurr	Shurr
		Bubisa	Badhola
			Mudhe
			Manyatta

		Darade Chari Gollo	El besso
			Qorqa
		Burgabo	Emuro elema
			Dalacha shana
		Maikona	Diba Okotu
			Dadacha
			Bsbalesa
			Nomadic
		Dukana	Kubi athi
			Elyibo
			Garwole
			Dadacha kuni

## B: Training Agenda for the NBS Enumerator Training Workshop in Kenya

Training Agenda  
22.01.2016 – 27.01.2016  
Lodwar, Kenya

Training Agenda  
03.02.2016 – 07.02.2016  
Marsabit, Kenya

1 day	Topic	Tools	Responsible
09:00 – 09:15	Opening remarks and overview of SEWOH and the Food and Nutrition Security Project	Projector, flip chart, markers blank paper, pens	SO, JA, KW
09:15 – 09:30	Introduction of survey team and enumerators	Name tags, markers, blank paper flipchart, pens	SO, JA, KW
09:30 – 09:45	Overview of training activities/workshop agenda	Handouts	LW
09:45 – 10:15	Training objectives, expectations and ground rules for workshop	Flip chart paper/pencils PPT presentation	LW, TW
10:15 – 10:45	Explanation of the survey process and roles/ responsibilities of team members (team leader, supervisors and data collectors) Focus on role and contribution of the supervisors and enumerators	Projector, PPT presentation/ flipchart paper/ pencils	LW
10:45 – 11:00	Coffee/Tea break		
11:00 – 12:30	Review of questionnaire Questions and answers to the questionnaire	Questionnaires, Projector, PPT presentation	LW
12:30 - 13:30	Lunch break		

13:30 – 15:00	Review of questionnaire Questions and answers to the questionnaire	Questionnaires, Projector	LW
15:00 – 15:15	Coffee/Tea break		
15:15 - 16:45	Review of questionnaire Questions and answers to the questionnaire	Questionnaires, Projector	LW
16:45 – 17:00	Wrap up of day, feedback	Flipchart paper markers	LW, TW
<b>2 day</b>	<b>Topic</b>	<b>Tools</b>	<b>Responsible</b>
09:00 – 09:15	Briefing of day's agenda, group warm up,	Questionnaires, Projector	LW
09:15 – 11:00	Review of questionnaire Questions and answers to the questionnaire	Questionnaires, Projector	LW
11:00 – 11:15	Coffee/Tea break		
11:15 – 12:30	Review of questionnaire	Field guide, Projector	LW
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, enumerator guidelines consent form,  PPT presentation	LW
14:30 – 15:00	Practice questionnaire in pairs (excluding 24h-recalls)	Questionnaire	LW
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 presentation	LW
16:45 - 17:00	Wrap up of day – what did we learn? Feedback	Flipchart paper markers	LW, TW
<b>3 day</b>	<b>Topic</b>	<b>Tools</b>	<b>Responsible</b>
09:00 – 09:15	Briefing of day's agenda, group warm up, clarifying questions		LW, TW
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 presentation	LW
11:00 – 11:15	Coffee/Tea break		
11:15– 11:30	Introduction to tablets	Tablets	LW, AMB
11:30 – 12:30	Practice of questionnaire in small groups using the tablets	Questionnaire, Tablets	LW, AMB
12:30 – 13:30	Lunch break		

13:30 – 15:30	Group discussion: Clarifying questions on questionnaire and other questions Finalizing the questionnaire	Projector, Questionnaire	LW
15:30 – 15:45	Coffee/Tea break		
15:45 – 16:45	Practice questionnaire in small groups using the tablets	Questionnaires, pens, Tablets	LW, AMB
16:45 – 17:00	Wrap up, Feedback	Flipchart paper Marker	LW, TW
4 day	Topic	Tools	Responsible
07:30 – 15:00	Pre-test in a nearby village	Questionnaires, Tablets	JA, TW, LW, AMB
<b>5 day</b>	<b>Topic</b>	<b>Tools</b>	<b>Responsible</b>
10:30 – 12:30	Lessons Learnt Discussion of experience during the pre-test, follow-up on challenges.		LW, AMB
12:30 – 13:30	Lunch break		
13:30 – 15:30	Presentation of adjusted questionnaire	Questionnaires	LW, AMB
15:30 – 15:45	Coffee/Tea break		
15:45 – 16:30	Overview of logistics for data collection period	Flip chart	JA, SO, KW

## C: Nutrition Baseline Survey Guidelines for Interviewers

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

### **How to conduct the interview:**

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

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

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

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

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

**How to use the tablet:**

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

**How to fill in the questionnaire:**

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

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

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

1 2 3 4 5 6 7 8 9 0

If you made a mistake, correct it clearly!

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

## D: Quality Control Protocol for Interviewer

Interviewer 1: \_\_\_\_\_

Date: \_\_\_\_\_

Interviewer 2: \_\_\_\_\_

Supervisor: \_\_\_\_\_

<b>DID INTERVIEWER 1 . . .</b>	<b>YES</b>	<b>NO</b>
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		
<b>DID INTERVIEWER 2...</b>	<b>YES</b>	<b>NO</b>
Put the cell phone on silent and did not interrupt the interview to take calls?		
Communicate that he/she is ready to record the answers at the beginning of the interview		
Thank the respondent for the time spent and involvement in the survey?		
Copy the information from both 24h recalls after the interview		
Discuss with interviewer 1 the household observations		

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

1 2 3 4 5 6 7 8 9 10

Other Comments/Plan of Action for Making Improvements:

# E: Nutrition Baseline Survey Questionnaire: Kenya

Date: \_\_\_\_\_

Name of Mother: \_\_\_\_\_

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 certificate/ MCH/ /vaccination card and record the birth date from it) If there is no written record, try to find the birth date using a local calendar of events	BIRTHDAT	[ ][ ][ ][ ] [ ][ ][ ][ ] Day Month Year
2	What is your year of birth or age in years?	A Record year of birth 88= don't know	BDATEMO [ ][ ][ ][ ] Year
		B Record age in years 88= don't know	AGEMO [ ][ ]
<b>If the child was not born between February 2014 (month/year) and July 2015 (month /year), 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.</b>			
<b>Demographic and socio-economic information</b>			
3	What is your marital status?	1= Married monogamous 2= Married polygamous 3= Widowed 4= Divorced or separated 5= Single	MARSTAT [ ][ ]
4	Who is the head of this household?	1= Male 2= Female	HEADHH [ ][ ]
5	Which community (tribe) do you belong to?	1= Gabbra 2= Borana 3=Rendille 4=Samburu 5=Turkana 6=Burji 7=Meru 8=Dasnach 9= Garri 99=Others (Specify)___	ETHNICIT [ ][ ]
6	Resident by?	1= Birth 2= Marriage 3= Fertile land/ better livelihood 99=Other (Specify):_	SETTLE [ ][ ]
7	How many people live <b>permanently</b> in your household? <b>(In the past 6 months)</b>	<b>Record total number of household members</b>	HHMEMNO [ ][ ]
8	Highest level of school attended?	0= no schooling <b>If no, go to → Q9</b> 1= primary 2= secondary 3= more than secondary 99=Other (Specify):_	EDUCLEV [ ][ ]

8a	What is the highest class you completed at school?	<b>Record number of years at level of schooling</b> 88=Don't know	EDUCYEAR	<input type="text"/>
9	What are the sources of income for your household throughout the year? <b>List as many as relevant to the household.</b>		0= no, 1= yes 88= don't know	
	Sale of own produced crops including grains, vegetables and fruits (market sale)		INCCROP	<input type="text"/>
	Sale of own animal or produced animal products		INCANIMA	<input type="text"/>
	Sale of own produced or gathered goods/crafts (charcoal, stones, firewood, baskets, etc...)		INCGOOD	<input type="text"/>
	Casual labour/temporary salary (daily wages)		INCTEMP	<input type="text"/>
	Small business (mini shops, local drinks (brew), etc...)		INCBUISN	<input type="text"/>
	Employment/ regular salary		INCSALAR	<input type="text"/>
	Remittances from relatives/husband		INCREMITT	<input type="text"/>
	Income generated by sale or exchange of public transfers (cash for work, food for work, food vouchers, fertilizer or seed vouchers, HSNP (Hunger Safety Net Programme etc.)		INCPUBTR	<input type="text"/>
	Subsistence farming		INCSUBS	<input type="text"/>
	Fishing		INFISH	<input type="text"/>
	Other(Specify): _____		INCSPEC	<input type="text"/>
10	Does any member of this household have access to any land that can be used for agriculture?	0= no <b>If no, go to →Q 12</b> 1= yes	HHLAND	<input type="text"/>
11	Which crops did your household grow on the land in the past one year? <b>List as many as relevant to the household.</b>		0= no, 1= yes 88= don't know	
	Maize		MAIZE	<input type="text"/>
	Finger millet		FMILLET	<input type="text"/>
	Sorghum		SORGHUM	<input type="text"/>
	Teff		TEFF	<input type="text"/>
	Irish potatoes		WSPOT	<input type="text"/>
	Orange fleshed sweet potatoes		OSPOT	<input type="text"/>
	Cassava		CASSAVA	<input type="text"/>
	Green bananas		BANANA	<input type="text"/>
	Legumes (beans, peas, green grams, lentils, soya)		LEGUMES	<input type="text"/>
	Groundnuts		GNUTS	<input type="text"/>
	Sesame		SESAME	<input type="text"/>
	Sunflower		SUNFLO	<input type="text"/>
	Miraa		MIRAA	<input type="text"/>
	Others:(specify): _____		GROSPEC	<input type="text"/>
11a	Among the crops produced by your household during the last cultivation season, which ones are the most important/ brought in the most income?		<b>Please rank the first three most important crops?</b> 0=No 1=Most important 2=Second most important 3=Third most important	
	Maize		MAIZE1	<input type="text"/>
	Finger millet		FMILLET1	<input type="text"/>

	Sorghum		SORGHUM1	<input type="checkbox"/>
	Teff		TEFF1	<input type="checkbox"/>
	Irish potatoes		WSPOT1	<input type="checkbox"/>
	Orange fleshed sweet potatoes		OSPOT1	<input type="checkbox"/>
	Green bananas		BANANA1	<input type="checkbox"/>
	Legumes (beans, peas, green grams, lentils, soya)		LEGUMES1	<input type="checkbox"/>
	Groundnuts		GNUTS1	<input type="checkbox"/>
	Sesame		SESAME1	<input type="checkbox"/>
	Sunflower		SUNFLO1	<input type="checkbox"/>
	Miraa		MIRAA1	<input type="checkbox"/>
	Others:(specify): _____		GROSPEC1	<input type="checkbox"/>
12	Do you have a home garden?	0= no → <b>If no, go to Q 13a</b> 1= yes	HOMEGAR	<input type="checkbox"/>
13	Do you grow vegetables in your home garden?	0= no 1= yes, but only during the wet season 2= yes, but only during the dry season 3= yes, year-round	GROVEG	<input type="checkbox"/>
13a	Do you grow vegetables anywhere else other than in a home garden?	0= no <b>If no, go to Q 14</b> 1= yes, on irrigated land 2= yes, on rain-fed land	GROVEGWH	<input type="checkbox"/>
13b	What kind of vegetables do you grow/gather? (from the home garden or outside of the home garden), not buying at the market. <b>List as many as relevant to the household.</b>		0= no, 1= yes, 88= don't know	
	Tomatoes		VTOMATO	<input type="checkbox"/>
	Onions		VONION	<input type="checkbox"/>
	Carrots		VCARROTS	<input type="checkbox"/>
	Sukuma wiki (kales)		VSUKWIKI	<input type="checkbox"/>
	Cabbage		VCABBAGE	<input type="checkbox"/>
	Cowpea leaves (kunde)		VCOWPEAS	<input type="checkbox"/>
	Black nightshade (sujaa)		VBNSHADE	<input type="checkbox"/>
	Pumpkin leaves		VPKLEAVES	<input type="checkbox"/>
	Amaranth		VAMARANTH	<input type="checkbox"/>
	Sagaa		VSAGAA	<input type="checkbox"/>
	Wild vegetables (amaranth, dodo, etc...)		VWILD	<input type="checkbox"/>
	Other (specify): _____		VSPEC	<input type="checkbox"/>
13c	What is the main use of the vegetables produced/ gathered?	1= mainly own consumption 2= mainly for sale 3= both (in approx. equal amounts) 99=other (specify):__	USEVEG	<input type="checkbox"/>
14	Do you grow any fruits and / or have any fruit or fruit trees in your homestead that are accessible to you and your family?	0= no → <b>If no, go to Q 16</b> 1= yes	GROFRUIT	<input type="checkbox"/>

14a	What kind of fruits do you grow or fruit trees are accessible to you and your family? <b>List as many as relevant to the household.</b>		0= no, 1= yes, 88= don't know	
	Mango		FMANGO	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Citrus		FCITRUS	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Guava		FGUAVA	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Papaya		FPAPAYA	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Banana		FBANANA	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Avocado		FAVOCAD	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Wild fruits		WFRUIT	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Watermelon		FWTMELON	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Other (specify): _____		FSPEC	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
15	Main use of fruits grown/ accessible to your family?	1=mainly own consumption 2= mainly for sale 3= both (in approx. equal amounts) 99=other (specify): ____	USEFRU	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
16	Does this household own any livestock herds, or farm animals, or poultry, or fishponds?	0= no → <b>If no, go to Q 17a</b> 1= yes	ANIMALS	<input type="checkbox"/>
16a	What type of farm animals/ livestock is reared in this household?		0= no, 1= yes 88= don't know	
	Cattle		CATTLE	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Donkey		DONKEY	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Camel		CAMEL	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Sheep		SHEEP	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Goat		GOAT	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Poultry (chicken, duck, doves, guinea fowl, turkey, geese)		POULTRY	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Pigs		PIGS	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Other (Specify): _____		ANISPEC	
17	Main use of animal reared?	1= mainly own consumption 2= mainly for sale 3= both (in approx. equal amounts) 4= labour (transport, ploughing etc 99=other (specify): ____	USEANIM	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
17a	Which animals or animal products do you sell?		0= no, 1= yes, 88= don't know	
	Milk (sour or fresh)		MILK	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Local ghee		GHEE	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Live animals		LIVEANIM	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Fish		FISH	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Poultry (chicken, duck, doves, guinea fowl, turkey, geese)		POULTRY	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Eggs		EGGS	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Hides/ animal skin		HIDE	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

	Meat ( sold in open markets)	MEAT	
	Other (Specify): _____	ANISPEC	
17b	Which gathered products/or crafts do you sell ( ask for products based on natural resources e.g. fire wood)	0= no, 1= yes, 88= don't know	
	Firewood	FIREWOOD	
	Charcoal	CHARCOAL	
	Stones	STONES	
	Wild fruits	WFRUIT	
	Wild leaves	WLEAVES	
	Grass	GRASS	
	Mats	MATS	
	Baskets	BASKETS	
	Other (specify): _____ (huts, chairs, traditional stool, beads, etc...)	GATHSPEC	
17c	For how many months during the whole year does your own food production cover the needs of your family? (all food product, crops, animals products, wild foods etc: <b>Record the number of months.</b>		
	In a good year, how many months? _____ months	MONGDYR	
	In a bad year, how many months? _____ months	MONBDYR	
18	Do you or any other family member of your household participate/ benefit in any of the following programs:	0= no, 1= yes, 88= don't know	
	School feeding	SCHOOLF	
	Agricultural development	AGRDEV	
	Cash transfer	CASHTRA	
	Food aid	FOODAID	
	Food for assets/work	FOODAS	
	Supplementary feeding	SUPPFEE	
	Other (specify): _____:	SUPPSPEC	

### Sanitation and Hygiene Information

19	What is the main source of drinking water for members of your household during the <b>rainy/ wet season?</b>	1 piped water into dwelling, to yard or plot, public tap/standpipe, tubewell / borehole, protected dug well, protected spring, rainwater collection 2 unprotected spring, unprotected dug well, cart with small tank/drum, tanker truck, surface water (river, stream, dam, lake, pond, canal, irrigation channel), bottled water)	DRINKWAW	
19a	What quantity of water (20 litre jerricans) are consumed by the household per day during the <b>rainy/ wet season</b> (minus the one used for animals)? <b>Record number of jerricans per day.</b>		QUANTWAW	

19b	How long/ far do you have to walk/ trek to get household water during the <b>rain/ wet season</b> (round trip)	1= near (<30 minutes) 2= moderate (30- 1 hour) 3= far (more than 1 hour) 88=do not know	DISTWAW	
20	What is the main source of drinking water for members of your household during the <b>dry/hot season</b> ?	1 piped water into dwelling, to yard or plot, public tap/standpipe, tube well / borehole, protected dug well, protected spring, rainwater collection 2 unprotected spring, unprotected dug well, cart with small tank/drum, tanker truck, surface water (river, stream, dam, lake, pond, canal, irrigation channel), bottled water	DRINKWAD	
20a	What quantity of water (20 litre jerricans) consumed by the household per day during the <b>dry/ hot season</b> (minus the one used for animals)? <b>Record number of jerricans per day.</b>		QUANTWAD	
20b	How long/ far do you have to walk/ trek to get household water during the <b>dry/hot season</b> (round trip)?	1= near (<30 minutes) 2= moderate (30- 1 hour) 3= far (more than 1 hour) 88=do not know	DISTWAD	
21	How do you store drinking 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	
22	Do you do anything to your water before drinking?	0= no <b>If no, go to → Q 23</b> 1= yes 88= don't know	TREATWA1	
22a	What do you usually do to the drinking water?	0= nothing 1= boil it 2= add bleach/chlorine (water guard) 3= strain it through a cloth 4= use a water filter (ceramic, sand, composite, etc.) 5= use solar disinfection 6= let it stand and settle 7= Add traditional herbs 88= don't know 99= other (specify): _____	TREATWA2	
23	Does this household have access to a toilet facility? <b>Observe if there is any toilet facility in the homestead</b>	0= no 1= yes 88= don't know	LATRINE	
23a	What kind of toilet facility do members of your household usually use?	1= Pit latrine latrine with slab, composting toilet  2= Pit latrine without slab/open pit, bucket, hanging toilet/hanging latrine, bush or field or lake.	TYPLATRINE	

### Household Food Insecurity Experience Scale

24	<b>Now I would like to ask you some questions about food. During the last MONTH, was</b>			
a	You were worried that you would <b>not have enough food to eat</b> 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 were <b>unable to eat healthy and nutritious food</b> because of a lack of	0= no 1= yes 88 = don't know 98= refused/no answer	HFIESB	□□□
c	You ate only <b>a few kinds of foods</b> because of a lack of money or other resources	0= no 1= yes 88 = don't know 98= refused/no answer	HFIESC	□□□
d	You had to <b>skip a meal</b> because there was not enough money or other resources to get food	0= no 1= yes 88 = don't know 98= refused/no answer	HFIESD	□□□
e	Still thinking about the last MONTH, was there a time when you <b>ate less than you thought you should</b> because of a lack of money or	0= no 1= yes 88 = don't know 98= refused/no answer	HFIESE	□□□
f	Your household <b>ran out of food</b> because of a lack of money or other resources	0= no 1= yes 88 = don't know 98= refused/no answer	HFIESF	□□□
g	You <b>were hungry but did not eat</b> because there was not enough money or other resources for food	0= no → <b>If no, go to Qi</b> 1= yes 88 = don't know <b>If no, go to → Qi</b>	HFIESG	□□□
h	In the last <b>MONTH (=30 days, or 4 weeks), how often</b> did it happen that you or others in your household <b>were hungry but did not eat</b> because there was not enough money or other resources for food? Did this happen only once or twice, in some weeks but not every week, or almost every week?  <i>Note: If respondent says this did not happen in the last MONTH, go back to Qg and code as</i>	1= Only once or twice 2= In some weeks but not every week 3= Almost every week 88= Don't Know 98= refused/no answer  0= did not happen	HFIESH	□□□
i	In the last MONTH, was there a time when you or others in your household <b>went without eating for a whole day</b> because of a lack of money or other resources?	0= no → <b>If no, go to Q25</b> 1= yes 88 = don't know <b>If no, go to → Q25</b>	HFIESI	□□□
j	In the last <b>MONTH (=30 days, or 4 weeks), how often</b> did it happen that you or others in your household <b>went without eating for a whole day</b> because of a lack of money or other resources? Did this happen only once or twice, in some weeks but not every week, or almost every week?  <i>Note: If respondent says this did not happen in the last MONTH, go back to Qi and code as</i>	1= Only once or twice 2= In some weeks but not every week 3= Almost every week 88= Don't Know 98= refused/no answer  0= did not happen	HFIESJ	□□□

<b>Child Information</b>				
25	Is your child a boy or a girl?	1 = male 2 = female	SEXCHILD	□□
<b>Information on Breastfeeding</b>				
26	Has (name of child) ever been breastfed?	0= no 1= yes 88= don't know	IBFQ10	□□□
26a	What did you give your child (name of child) immediately	1 = breast milk	BFAFTERB	□□□

	after giving birth?	2= water 3= water and sugar 4= milk from animal 5= ghee 88= don't know 99= other, specify: _____		
27	Was (name of the child) breastfed <b>yesterday</b> during day or at night?	0= no 1= yes 88= don't know	IYCFQ7	LL
27a	Did (name of child) consume breast milk in any other way yesterday during the day or at night? e.g. by spoon, cup or bottle; by his/her mother or another woman?	0= no 1= yes 88= don't know	IYCFQ7A	LL

**Information on childcare**

28	Who is supporting you in taking care of (name of child)?	0= respondent alone 1= mother/mother-in-law 2= older siblings of child 3= Spouse/ other male relative 99=Other (specify): _____	CARESUP	LL
28a	Who was taking care of (name of child) yesterday?	0= respondent alone 1= mother/mother-in-law 2= older siblings of child 3= Spouse or other male relative 99=Other (specify): _____	CAREYES	L

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

29a	Now I would like to ask you about some liquids that (name of child) may have had yesterday during the day or night. Did (name of child) have any.... <i>Read each item aloud and record response before proceeding to the next item.</i>			<b>RECORD: 0= no, 1= yes, 88= don't know</b>
	<b>A Infant formula such as [insert local examples]?</b>		IYCFQ10B	LL
	If yes, how many times yesterday during the day or at night did (name of child) consume infant formula?		IYCFQ11B	LL
	<b>B Tinned, powdered, fresh or packed milk?</b>		IYCFQ10C	LL
	If yes, how many times yesterday during the day or at night did (name of child) consume milk tinned, powdered, fresh or packed milk?		IYCFQ11C	LL
	<b>C Sour milk, yoghurt?</b>		IYCFQ10F	LL
	If yes, how many times yesterday during the day or at night did (name of child) consume milk or yoghurt?		IYCFQ11F	LL
29b	<b>ANNEX: 24-HOUR RECALL CHILDREN</b>			

**Minimum Meal Frequency**

30c	Did (name of child) receive anything to eat/any kind of food yesterday?	0= no <b>If no, go to → Q 32</b> 1= yes 88= don't know <b>If no, go to → Q 32</b>	IYCFQ13	LL
31	How many times did (name of child) receive food including <b>meals</b> and <b>snacks</b> yesterday?	<b>Record number of times</b> 88= don't know	IYCFQ14	LL
<b>Feeding Habits</b>				
32	Was (name of child)'s intake of food yesterday different from usual	0= no 1= yes 88= don't know	CFUSUAL	LL

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

	Children do not grow as they should (growth faltering)	RECMAL4	<input type="checkbox"/>
	Others (Specify): _____		<input type="checkbox"/>
40	What are some of the reasons why people are malnourished? <b>Do not read the answers, Check all that applies</b>	<b>0= no, 1= yes, don't know</b>	
	Not getting enough food	REAMAL1	<input type="checkbox"/>
	Food is watery, does not contain enough nutrients	REAMAL2	<input type="checkbox"/>
	Disease/ill and not eating food	REAMAL3	<input type="checkbox"/>
	Other ( Specify) _____		<input type="checkbox"/>
41	What should we do to prevent malnutrition among young children (6–23 months) <b>Do not read the answers, Check all that applies</b>	<b>0= no, 1= yes</b>	
	Give more food	PRVMAL1	<input type="checkbox"/>
	Give different types of food each day	PRVMAL2	<input type="checkbox"/>
	Feed frequently	PRVMAL3	<input type="checkbox"/>
	Give attention during meals	PRVMAL4	<input type="checkbox"/>
	Go to the health center/hospital and check that the child is growing (growth monitoring services)	PRVMAL5	<input type="checkbox"/>
	Others (Specify) _____		<input type="checkbox"/>
42	Do you have a counselling structure for nutrition in your village? <b>If yes, which one?</b>	0= no 1= Health extension worker/ CHVs 2= volunteer group (mother to mother support groups) 3= agricultural extension service (development agents) 99= Others, (specify):	NUSTRUC <input type="checkbox"/>
43	Do you receive any nutrition counselling? <b>If yes, from where/ from whom?</b>	0= no 1= Health extension worker/ CHVs 2= volunteer group (mother to mother support groups) 3= agricultural extension service (development agents) 99= Others, specify:	NUCOUN <input type="checkbox"/>
44	Have you participated in any cooking demonstration in the past six months?	<b>0= no, If no, go to → Q 45 1= yes</b>	CODEMON <input type="checkbox"/>
44a	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 <input type="checkbox"/>
<b>Women (Mother/ Caregiver) Information</b>			
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 <input type="checkbox"/>
46	How many times did you go to the under 5 clinic with (name of child)?	Record number of times 88= don't know	UNDER5 <input type="checkbox"/>

	Does your household have soap (or washing powder/ liquid) at present? <i>Ask her to show you the soap.</i>	0= no, 1=yes, 88= don't know	HHSOAP	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
47a	When you used soap today or yesterday, what did you use it for? If "for washing my hands" is mentioned, probe what was the occasion, but do not read the answers! <i>(Do not read the answers, ask to be specific, encourage "what else" until nothing further is mentioned and check all that applies)</i>			
	Washing my children's hands		WCHILDH	<input type="checkbox"/>
	Washing hands after visiting the toilet (defecation)		WCHILDD	<input type="checkbox"/>
	Washing hands after cleaning child (after child defecation)		WAFTERC	<input type="checkbox"/>
	Washing hands before feeding child		WBEFFED	<input type="checkbox"/>
	Washing hands before preparing food		WBEFFOO	<input type="checkbox"/>
	Washing hands before eating		WBEFEAT	<input type="checkbox"/>
	Washing body, hair, clothes, dishes and pots, cleaning the house		WBODY	<input type="checkbox"/>
	Others (Specify) _____			
47b	Please describe step by step how you wash your hands  <i>Note: do not read out the answers</i>	1= washes hands in a <b>bowl of water</b> (sharing with other people) – poor practice 2= with someone pouring a little <b>clean water</b> from a jug onto one's hands – appropriate practice 3= <b>under running water</b> – appropriate practice	HANDWA1	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
		1= washes hands with soap or ashes 2= other (Specify): _____ 88= don't know	HANDWA2	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
48	Did you ever receive any hygiene counseling?	0= no 1= yes 88= don't know	HWCOUN	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
49	<b>ANNEX 24 HOUR RECALL FOR WOMEN</b>			

**Thank the mother for her time and cooperation.**

## F: 24 Hour Recalls for Children

Date: \_\_\_\_\_

Child's name: \_\_\_\_\_

Enum ID 1: \_\_\_\_\_

Enum ID 2: \_\_\_\_\_

<p>30b Please describe everything that (name of child) ate yesterday during the day or night, whether at home or outside the home.</p> <p><b>(a)</b> Think about when (name of child) first woke up yesterday. Did (name of child) eat anything at that time? If Yes, please tell me everything that (name of child) ate at that time. <b>Probe: Anything else? Then continue to question b</b></p> <p><b>(b)</b> What else did (name of child) eat? Did (name of child) eat anything at that time? If yes, please tell me everything that (name of child) ate at that time. <b>Probe: Anything else?</b></p>		
First food after waking up?		
Anything else?		
Anything else?		
v else?		
Anything else?		
Anything else?		
Anything else?		
If food was consumed =1, If food was not consumed=0		
<b>Cereals:</b> Porridge, nangaria, ugali, bread, rice, chapati, mandazi, noodles, spaghetti, scones, doughnuts, biscuits, boiled maize, or any foods made from grains like maize (corn), sorghum, millet, rice, wheat or teff, gita buthena, michicha, fiqe, loshoro, qanchbello, anjera (pan cake)	iycfq12a	<input type="checkbox"/>
<b>Orange fleshed roots/tubers or vegetables</b> Pumpkin, butternut, carrots, squash or sweet potatoes that are yellow or orange inside + other locally available vitamin-A rich vegetables	iycfq12b	<input type="checkbox"/>
<b>White roots and tubers:</b> White sweet potatoes, irish potatoes, white yams, manioc, cassava or cassava-porridge, coco yams, egilae, ng'akopora, or any white roots and tubers or foods made from these white roots	iycfq12c	<input type="checkbox"/>
<b>Dark green leafy vegetables:</b> Any dark green leafy vegetables including wild and indigenous dark green vegetables such as kales (sukuma wiki), cowpeas leaves (kunde), managu (black nightshade), amaranth (terere), (spider plant (saga), cassava leaves, sweet potato leaves, bean leaves, pumpkin leaves (mshebebe leaves), louyong'orok, rape, mustard etc and other local dark green leafy vegetables, shalgeda horda	iycfq12d	<input type="checkbox"/>
<b>Orange fleshed fruits:</b> Ripe mangoes, ripe paw paws + (other local Vitamin-A rich fruits)	iycfq12e	<input type="checkbox"/>
<b>Other fruit and vegetables:</b> Any other fruits or vegetables including wild fruits and vegetables like cabbage, eggplants, tomatoes, onions, green pepper, green/fresh beans, mushrooms, okra, oranges, lemons, tangerines, bananas, pineapples, avocado, dates, watermelon, ng'apedur, ng'akalalio, eng'omo, emeyan, ng'alam, eong'ol, edapal, edung, esekon, qone, bururi, ogomthi, roga, deka, dogomdi	iycfq12f	<input type="checkbox"/>

<b>Organ meat:</b> Organ meats such as liver, kidney, heart, pancreas, blood or blood based foods, offal, or other organ meats	iycfq12g	<input type="checkbox"/>
<b>Flesh meat:</b> Any meat including beef, lamb, goat, donkey, camel, bush/ wild meat, poultry including chicken, turkey, duck, geese, koche, kur'kude	iycfq12h	<input type="checkbox"/>
<b>Eggs:</b> Eggs from any kind of birds	iycfq12i	<input type="checkbox"/>
<b>Fish:</b> Fresh or dried fish, shellfish, or any other sea foods	iycfq12j	<input type="checkbox"/>
<b>Pulses, nuts and seeds:</b> Any foods made from beans, ground beans, peas, lentils, soya, groundnuts, tree nuts, or seeds, green grams, pigeon peas, chick peas, plumpy nuts, edung', edapal	iycfq12k	<input type="checkbox"/>
<b>Milk and milk-products:</b> Milk, cheese, yoghurt, sour milk, edodo, akidiedet, or other milk products, suche, ititu, gaman, lkisich	iycfq12l	<input type="checkbox"/>
<b>Oils/Fats:</b> Any fat, oil, ghee, butter, akuring' (fat from sheep/ pigs) or foods made with any of these, dubb (fat from a sheep), gobbugala, ntoob, diret, ngidongoi, mo'or	iycfq12m	<input type="checkbox"/>
<b>Sugar and sweets:</b> Any sugary foods such as chocolates, sugar, honey, sweets, candies, cakes, or biscuits, soda, fanta, coca cola, sprite, chocolate drinks, tea or coffee with sugar, ekaamit etc,	IYCFQ12N	<input type="checkbox"/>
<b>Condiments:</b> Condiments for flavor, such as ginger, spices, herbs (eusugu, eurumosing'), or fish powder, salt, tomato paste, flavor cubes such as royco, knorr etc.	iycfq12o	<input type="checkbox"/>

## G: 24 Hour Recalls for Mothers

Date: \_\_\_\_\_

Mother's name: \_\_\_\_\_

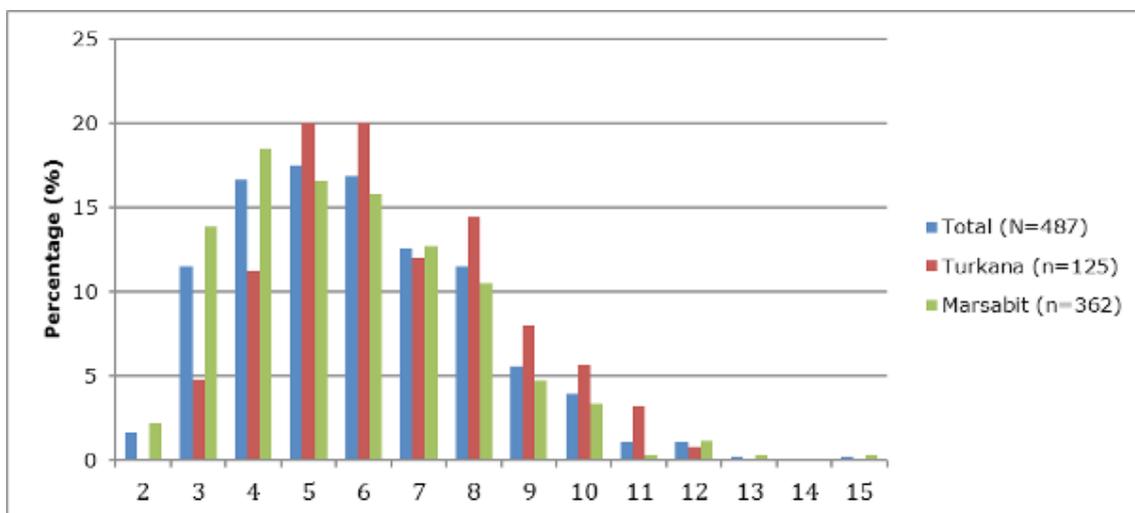
Enum ID 1: \_\_\_\_\_

Enum ID 2: \_\_\_\_\_

<p>50 Please describe everything that you ate yesterday during the day or night, whether at home or outside the home.</p> <p>(a) Think about when you first woke up yesterday. Did you eat anything at that time? If Yes, please tell me everything</p> <p style="text-align: center;"><i>Then continue to question b</i></p> <p>(b) What else did you eat? Go from possible meal to meal and complete the list. <b>Anything else?</b></p>	
First food after waking up	
Anything else?	
If food was consumed =1, If food was not consumed=0	

Consider quantities!!!! Minimum 15g = 1 Tablespoon	Cereals: Porridge, nangaria, ugali, bread, rice, chapati, mandazi, noodles, spaghetti, scones, doughnuts, biscuits, boiled maize, or any foods made from grains like maize (corn), sorghum, millet, rice, wheat or teff, gita buthena, michicha, fiqe, loshoro, qanchbello, anjera (pan cake)	iWddsa	<input type="checkbox"/>
	White roots and tubers: White sweet potatoes, irish potatoes, white yams, manioc, cassava or cassava-porridge, coco yams, egilae, ng'akoporae or any white roots and tubers or foods made from these	iWddsb	<input type="checkbox"/>
	Pulses: Any foods made from mature beans or peas (fresh or dried), ground beans, lentils, soya, or products like tofu, tempeh green grams, pigeon peas, chick peas	iWddsc	<input type="checkbox"/>
	Nuts and seeds: Any foods made from groundnuts (groundnut flower), tree-nuts, or seeds including sunflower seeds, sesame seeds, pumpkin seeds, plumpy nuts, edung', edapal and any other local seeds	iWddsD	<input type="checkbox"/>
	Milk and milk-products: Milk, cheese, yoghurt, edodo, akidiedet or other milk products, suche, ititu, qaman, lkisich	iWddsE	<input type="checkbox"/>
	Organ meat: Organ meats including liver, kidney, heart, pancreas blood-based foods, offals, or other organ meats (including from wild game)	iWddsF	<input type="checkbox"/>
	Flesh meat: Any meat, such as beef, lamb, goat, donkey, camel, poultry (chicken, turkey, doves, geese, ducks), meat from small animals like rabbits and bush/ wild/ game meat, koche, kur'kude	iWddsG	<input type="checkbox"/>
	Fish: Fresh or dried fish, shellfish, or sea foods	iWddsH	<input type="checkbox"/>
	Eggs: Eggs from any kind of birds	iWddsi	<input type="checkbox"/>
	Dark green leafy vegetables: Any dark green leafy vegetables including wild dark green vegetables like kales (sukuma wiki), cow pea leaves (kunde), managu (black nightshade), amaranthus (terere), spider plant (sagaa), cassava leaves, sweet potato leaves, bean leaves, pumpkin leaves (mshebebe), louyong'orok, rape, mustard etc and other local indigenous dark green leafy vegetables, shalgeda horda	iWddsj	<input type="checkbox"/>
	Orange roots/tubers or vegetables: Pumpkin, carrots, squash, or yellow/orange fleshed sweet potatoes	iWddsk	<input type="checkbox"/>
	Orange fleshed fruits: Ripe mangoes, ripe paw paws and other local vitamin A-rich fruits	iWddsl	<input type="checkbox"/>
	Other vegetables: Any other vegetables including wild vegetables like cabbage, eggplants, tomatoes, onions, green pepper, green/fresh beans, mushrooms, okra	iWddsm	<input type="checkbox"/>
	Other fruits: Any other fruit including wild fruits like oranges, lemons, tangerines, bananas, avocado, coconut flesh, dates, watermelon, ng'apedur, ng'akalalio, eng'omo, emeyan, ng'alam, dogondi,, eong'ol, edapal, edung, esekon, roqa, deka, bururi, ogomthi, qone	iWddsn	<input type="checkbox"/>
Insects: Any edible insects such as termites (ng'ikong') etc	iWddso	<input type="checkbox"/>	
Oils/ fats: Oil, fats, ghee or butter added to food or used for cooking, including extracted oils from nuts, fruits and seeds, and all animal fat including akuring' (fat from sheep/ pigs), dubb (fat from a sheep), gobbugala, ntoob, diret, ngidongoi, mo'or	iWddsp	<input type="checkbox"/>	
Fried snacks: Crisps and chips, fried potatoes, fried dough (doughnuts, mandazi), other fried snacks	iWddsq	<input type="checkbox"/>	
Sugar and sugary foods: Any sugary foods such as chocolates, sugar, honey, sweets, candies, cakes, or biscuits, ekaamit	iWddsr	<input type="checkbox"/>	
Sweet drinks or alcoholic beverages Sweetened fruit juice or juice-drinks, soft drinks/fizzy drinks like, fanta, coca cola, sprite, chocolate drinks, tea or coffee with sugar, ekaamit etc.	iWddss	<input type="checkbox"/>	
Condiments: Condiments/ Ingredients used in small amounts for flavor, such as ginger, spices, herbs(eusugu, eurumosing'), or fish powder, salt, tomato paste, flavor cubes such as roycu, knorr etc	iWddst	<input type="checkbox"/>	

## H: Distribution of Household Sizes



## I: Knowledge score on complementary feeding and malnutrition

	Total (N=487)	Turkana (N=125)	Marsabit (N=362)
<b>Mentioned types of food making porridge more nutritious</b>			
Mean	1.7	1.9	1.7
SD	0.5	0.5	0.5
Md	2.0	2.0	2.0
Min	0.0	0.0	0.0
Max	3.0	3.0	3.0
<b>Mentioned signs of malnutrition</b>			
Mean	2.3	3.2	2.0
SD	1.0	0.9	0.8
Md	2.0	3.0	2.0
Min	0.0	1.0	0.0
Max	4.0	4.0	4.0
<b>Reasons why people are malnourished</b>			
Mean	2.0	2.5	1.8
SD	0.7	0.6	0.6
Md	2.0	3.0	2.0
Min	0.0	1.0	0.0
Max	3.0	3.0	3.0

How to prevent malnutrition			
Mean	2.6	3.6	2.3
SD	1.2	1.3	1.1
Md	2.0	4.0	2.0
Min	0.0	1.0	0.0
Max	5.0	5.0	5.0

## J: Individual Dietary Diversity Score – Women (IDDS-W)

N=487	Total	Turkana	Marsabit
Mean	3.2	3.0	3.2
SD	1.2	1.6	1.1
Md	3.0	3.0	3.0
Min	0	0	0
Max	7	7	7

## K: Food Group Score - Women

N=487	Total	Turkana	Marsabit
0	0.4	0.8	0.3
1	8.0	19.2	4.1
2	18.7	24.0	16.9
3	38.6	21.6	44.5
4	22.8	15.2	25.4
5	6.8	10.4	5.5
6	4.1	8.0	2.8
7	0.6	0.8	0.6

## L: Minimum Dietary Diversity – Women (MDD-W)

N=487	Total (%)	Turkana (%)	Marsabit (%)
MDD	11.5	19.2	8.8

## M: Feeding Frequency – children 6-23 months

N=410	Total	Turkana	Marsabit
Mean	3.2	3.2	3.3
SD	1.3	1.2	1.3
Md	3	3	3
Min	0	1	0
Max	7	7	7

## N: Individual Dietary Diversity Score – for all children

N=475	Total	Turkana	Marsabit
Mean	2.5	2.5	2.5
SD	1.3	1.5	1.2
Md	2.0	2.0	2.0
Min	0	0	0
Max	6	6	6

## O: Individual Dietary Diversity Score – breastfed children

n=392	Total	Turkana	Marsabit
Mean	2.3	2.3	2.3
SD	1.2	1.5	1.1
Md	2.0	2.0	2.0
Min	0	0	0
Max	6	6	6

## P: Individual Dietary Diversity Score – non-breastfed children

n=83	Total	Turkana	Marsabit
Mean	3.1	3.0	3.2
SD	1.2	1.5	1.1
Md	3.0	3.0	3.0
Min	1	1	1
Max	6	6	6

## Q: Food Group Score - Children

N=475	Total	Turkana	Marsabit
0	1.9	4.1	1.1
1	24.6	29.5	22.9
2	25.5	21.3	26.9
3	26.1	20.5	28.0
4	17.1	13.9	18.1
5	3.4	7.4	2.0
6	1.5	3.3	0.8

**Table 30: Summary of study results with main and project specific indicators**

Indicator	Study area	Overall n=487	Turkana n=125	Marsabit n=362
Dietary diversity women (10 food groups)				
IDDS-W [mean±SD]		3.2±1.2	3.0±1.6	3.2±1.1
MDD-W [%]		11.5	19.2	8.8
Dietary diversity children (7 food groups)				
IDDS-C [mean±SD]		2.5±1.3	2.5±1.5	2.5±1.2
MDD [%]		21.9	24.6	21.0
MMF [%]		71.4	72.7	70.9
MAD [%]		14.9	20.2	13.0
HFIES (classification) [%]				
Food secure		5.6	2.5	6.6
Mildly food insecure		8.8	2.5	10.8
Moderately food insecure		15.8	5.9	19.1
Severely food insecure		69.8	89.1	63.4
Potential income sources [%]				
Land availability		21.1	29.1	18.2
Home garden availability		8.0	5.6	8.8
Access to fruit trees		7.8	12.0	6.4
Rearing animals		78.4	71.2	80.9
Income by animal products (mainly live animals and milk)		max 80.5	max 67.8	max 84.3
Income by gathered products (mainly firewood and charcoal)		max 21.4%	max 49.6%	max 11.6%
WASH [%]				
Improved drinking water (dry season)		76.8	91.2	71.8
Improved sanitation facility		24.2	15.2	27.3
Household has soap available		61.4	60.0	61.9
Received hygiene counselling		38.8	68.8	28.5
Knowledge scores [mean±SD]				
Enriching porridge, max 5		1.7±0.5	1.9±0.5	1.7±0.5
Signs of malnutrition, max 4		2.3±1.0	3.2±0.9	2.0±0.8
Reasons of malnutrition, max 3		2.0±0.7	2.5 ±0.6	1.8 ±0.6
Prevent malnutrition, max 5		2.6±1.2	3.6±1.3	2.3±1.1
Received nutrition counselling [%]		24.4	43.2	18.0



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