SMART SURVEY FINAL REPORT – 2018

SMART SURVEY FINAL REPORT CONDUCTED IN THE LAISAMIS AND NORTH HORR SURVEY ZONES: MARSABIT COUNTY

22nd JANUARY – 2nd FEBRUARY, 2018

ACKNOWLEDGEMENT

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ACCROYNM AND ABBREVIATIONS

ANC: Antenatal Care
BCG: Bacillus Calmette–Guérin
BSFP: Blanket Supplementary Feeding Program
CI: Confidence Interval
CHMT: County Health Management Team
CLTs: Community Led Total Sanitation
CSI: Coping Strategy Index
DEFF: Design Effect
DHIS: District Health Information System
ECD: Early Childhood Development
ENA: Emergency Nutrition Assessment
FAO: Food and Agricultural Organization
FCS: Food consumption Score
FHK: Food for the Hungry Kenya
GAM: Global Acute Malnutrition
HAZ: Weight-for-Age Z score
HH: Household
HDDS: Household Dietary Diversity Score
HiNi: High Impact Nutrition Intervention
IFAS: Iron Folic Acid Supplementation
KABP: Knowledge, Attitude, Behavior and Practice
KII: Key Informant Interview
MAM: Moderate Acute Malnutrition
MNP: Micro Nutrient Powder
MIYCN: Maternal Infant Young Child Nutrition
MoH: Ministry of Health
MUAC: Mid Upper Arm Circumference
NDMA:National Draught Management Authority
NGO: Non-Governmental Organization
NIWG: Nutrition Information Working Group
OPV: Oral Poliovirus Vaccines
ORS: Oral Rehydration Salts
P&G: Procter & Gamble
PPS: Probability Proportional to Population Size
SAM: Severe Acute Malnutrition
SCHMT: Sub-County Health Management Team
SMART: Standardized Monitoring and Assessment in Relief and Transition

SPSS: Statistical Packages for social Sciences
UN: United Nations
UNICEF: United Nation Children Fund
WDDS: Women Dietary Diversity Score
WHO: World Health Organization
WAZ: Weight-for-Age Z score
WFA: Weight-for-Age
WHZ: Weight-for-Height Z score
WRA: Women of Reproductive age
VIP: Ventilated Improved Pit

EXECUTIVE SUMMARY

Marsabit County is one of the 47 county of the Republic of Kenya created under the Constitution 2010. It boarders Ethiopia to the North, Lake Turkana to the West, Samburu County to the South and Wajir and Isiolo Counties to the East. It covers an area of 70,961.3 Km2. It borders Isiolo County to the South West, Samburu County to the South, Lake Turkana to the West, Ethiopia to the North and Wajir County to the North West. The County consists of four sub-counties; Laisamis, North Horr, Saku, and Moyale. Although ranked as the largest county in the country, it has an estimated population of 352,993 from an estimated 61,850 households[1]. The county remains amongst the counties with the highest poverty index in the in Kenya and is ranked position 44 out of 47 counties with a poverty index rate of 83.2%. The county has four major livelihoods; Pastoral with 81%, agro-pastoral with about 16% and Business population at around Marsabit and Moyale towns and other minor livelihood Zones at 3% include formal employment and fisher folk along Lake Turkana. The main source of cash income in the county is livestock production contributing 82 percent in the pastoral livelihood zone and 60 percent in the agro-pastoral livelihood zone. Food crop production comes second in the agro-pastoral livelihood zone contributing 20 percent of cash income while in the pastoral zone, formal waged labor and petty trade contribute to 11 percent of cash income.

The County experiences poor health and nutrition outcomes which are mainly related to house hold food insecurity as a result of recurrent drought. After a period of almost a year when a drought emergency was declared by the Government of Kenya in February 2017, where in North Horr and Laisamis Sub Counties were affected. Robust emergency response strategy mounted by partners led by Ministry of Health through Blanket Supplementary Feeding Programme (BSFP) and integrated health and nutrition outreaches started almost immediately.

This Integrated SMART survey was conducted to establish the current nutrition status in the North Horr and Laisamis Sub counties.

Specific objectives of the survey were:

- ✓ To estimate the current prevalence of acute malnutrition in children aged 6 – 59 months
- ✓ To compare the overall nutritional changes with the previous GAM and SAM.
- ✓ To determine the morbidity rates amongst children aged 0-59 months over a two week recall period.
- ✓ To estimate the immunization coverage of Measles, BCG and Oral polio vaccines (OPV1 and 3).
- ✓ To determine the coverage for deworming, zinc supplementation for diarrhea and vitamin A supplementation among children 6-59 months.
- ✓ To estimate the nutritional status of women of reproductive age 15-49 years using MUAC measurements
- ✓ To collect information on possible underlying causes of malnutrition such as household food security, water, sanitation, and hygiene practices

[1] 2017 population estimates-DHIS

The survey was conducted in two Sub-Counties: Laisamis and North Horr. Each Sub county had its own independent sample. Sampling was done using the SMART methodology and applied two stage cluster sampling methodology with the clusters being selected using the probability proportional to population size (PPS). Stage one sampling involved the sampling of the clusters while the second stage sampling involved the selection of the households from the sampled clusters.

The number of clusters sampled was; 42 in Laisamis and North Horr. The total sample size for children aged between 6 and 59 month was; 437 in Laisamis and 501 in North Horr. The data collected during the survey included: anthropometry, morbidity, vaccination and de-worming status, Vitamin A supplementation, hygiene and sanitation practices, other indicators assessed were household food security and livelihood. The standard data collection tool recommended by the National Nutrition Information Working Group was used. All the sampled clusters were visited. In total 1,190 households were sampled from 84 clusters and 972 children aged 6 to 59 months were assessed for anthropometry. Anthropometric data was analyzed using the ENA software version (July 9th, 2015) while other indicators were analyzed using SPSS Version 20.0.

The survey findings indicated a GAM prevalence rate of 21.8% (18.0 – 26.1 95% C.I.) in North Horr and 21.2% (17.3-25.7 95% C.I.) in Laisamis Sub Counties, while the prevalence for severe malnutrition was 5.2% (3.4 – 7.9 95% C.I.) and 3.3%(2.1-5.1 95% C.I)in North Horr and Laisamis Sub Counties respectively. This is generally classified as ***Critical***[2] by the WHO classification of malnutrition. The findings also showed the prevalence of underweight at 26.5 % (22.1-31.3 95% C.I.) which was classified as ***High***[3] according to the WHO classification of underweight where 5.4 % (3.6 – 8.1 95% C.I.) were severely underweight in North Horr Sub county and in Laisamis Sub county prevalence of underweight at 34.4%(28.7-40.7% 95% C.I) which was classified as ***Alarming/critical***[4] according to the WHO classification of underweight where severe underweight at 8.5%(5.9-12.1 95% C.I.). In terms of stunting prevalence, the survey findings indicated that 19.9 % (16.0 – 24.3 95% C.I.) of children in North Horr Sub County were malnourished which was classified as ***low***[5] based on the WHO classification as where 4.4 % (2.6 – 7.4 95% C.I.) of the children were severely stunted. In Laisamis Sub County, the prevalence of stunting was 29.8% (24.6 -35.5 95% C.I) which was classified as ***medium***[6] based on the WHO classification as where 8.9% (6.1 -12.9 95% C.I) of the children were severely stunted.

The survey findings indicated that 22.7% (103) and 39.6% (217) of children aged 0-59 months in North Horr and Laisamis respectively was reported to have been ill two weeks prior to survey. The most prevalent illness during this period was acute respiratory illnesses/ cough in Laisamis at 70.0% and Fever with chills in North Horr at 78.6%. In term of supplementation, the survey findings indicate that the overall proportion of children (12-59 Months) supplemented with Vitamin A for at least 2 times in the period of one year preceding the survey was 43.5% and 48.0% in North Horr and Laisamis Sub Counties respectively which is way below the national target of 80%. In terms of zinc supplementation,

[2] WHO Cut Off Points using Z-Score ((-2 Z scores in populations: <5% - Acceptable; 5-9% - Poor; 10-14% - Serious; >15% - Critical)

[3] WHO Classification of Underweight: Low - <10%, Medium – 10 – 19.9%, High – 20 – 29.9%, Alarming/Critical - >30%

[4] WHO Classification of Underweight: Low - <10%, Medium – 10 – 19.9%, High – 20 – 29.9%, Alarming/Critical - >30%

[5] WHO Classification: Low - <20%, Medium - 20 – 29.9% , High – 30 – 39.9%, Alarming/Critical - >40.0%

[6] WHO Classification: Low - <20%, Medium - 20 – 29.9% , High – 30 – 39.9%, Alarming/Critical - >40.0%

41.7% and 75.7% in North Horr and Laisamis Sub Counties respectively had received the supplementation which is below the HiNi target of 80%. Additionally, the results of the survey showed that 32.5% and 13.2% in North Horr and Laisamis Sub Counties respectively of the households reported treating water before drinking. The results of the survey showed that among the caregivers interviewed 10.8% and 13.2% in North Horr and Laisamis Sub Counties respectively reported practicing proper hand washing at the 4 critical times. For the household dietary diversity, analysis showed that only 59.2% and 49.8% in North Horr and Laisamis Sub Counties respectively of the households consumed more than 5 food groups. Lastly, the survey results showed that the total weighted coping strategy score was 16.21 and 14.64 in North Horr and Laisamis Sub Counties respectively.

CHAPTER ONE

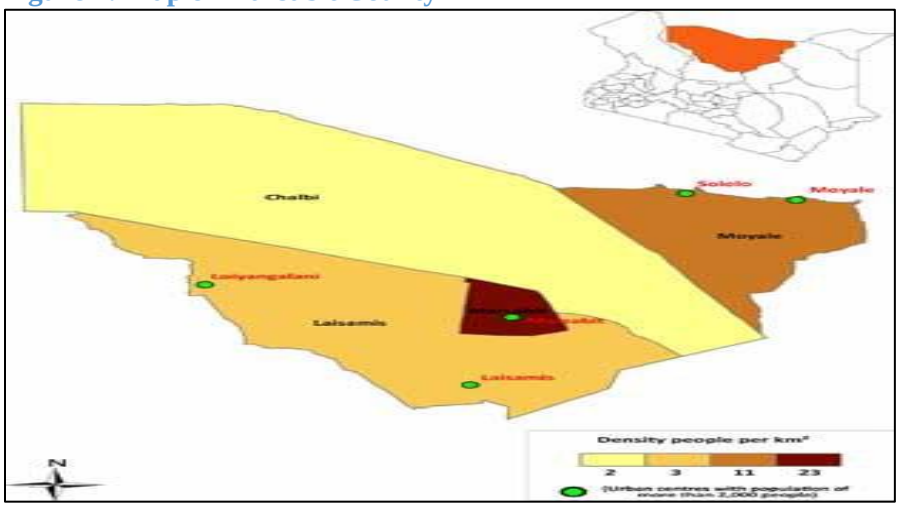
INTRODUCTION

1.1 Background

Marsabit County is one of the 47 county of the Republic of Kenya created under the Constitution 2010. It boarders Ethiopia to the North, Lake Turkana to the West, Samburu County to the South and Wajir and Isiolo Counties to the East. It covers an area of 70,961.3 Km2. It borders Isiolo County to the South West, Samburu County to the South, Lake Turkana to the West, Ethiopia to the North and Wajir County to the North West. The County consists of four sub-counties; Laisamis, North Horr, Saku, and Moyale. Although ranked as the largest county in the country, it has an estimated population of 352,993 from an estimated 61,850 households. The county remains amongst the counties with the highest poverty index in the in Kenya and is ranked position 44 out of 47 counties with a poverty index rate of 83.2%. The county has four major livelihoods; Pastoral with 81%, agro-pastoral with about 16% and Business population at around Marsabit and Moyale towns and other minor livelihood Zones at 3% include formal employment and fisher folk along Lake Turkana. The main source of cash income in the county is livestock production contributing 82 percent in the pastoral livelihood zone and 60 percent in the agro-pastoral livelihood zone. Food crop production comes second in the agro-pastoral livelihood zone contributing 20 percent of cash income while in the pastoral zone, formal waged labor and petty trade contribute to 11 percent of cash income.

The county experiences poor health and Nutrition outcomes especially due to Community Referral system is poor since community units are there but semi Functional and community Health services are poor hence most health facilities are not able to reach their catchment population. Thirdly, Vastness of the county and rough terrain i.e. in North Horr and Laisamis hence SCHMT operations have been narrowed to a limited scope of health facilities and with limited visits to far health facilities which are occasionally support by partners. Another major contributing factor of high malnutrition levels are: poor dietary diversity especially for women and poor child care and feeding practices which are related to hygiene and sanitation and cultural beliefs. To try to improve the health and nutrition status in the county, various partners have been working with the Ministry of Health in the implementation and up scaling the High Impact Nutrition Intervention (HiNi) in the County. For instance Concern Worldwide has been supporting the County Health Department in the implementation of the HiNi services in Moyale and North Horr Sub counties. On the other hand Food for the Hungry Kenya (FHK) has been supporting the MoH in the implementation and scaling up of HiNi in North Horr, Saku and Laisamis sub counties while World Vision has been supporting the same activities in Laisamis Sub counties.

Figure 1: Map of Marsabit County



1.2 Survey Objectives

1.2.1 General Objective

The general objective of the survey was to establish the current health & nutrition status in the North Horr and Laisamis Sub counties.

1.2.2 Specific Objectives

i. To estimate the current prevalence of acute malnutrition in children aged 6 – 59 months
ii. To compare the overall nutritional changes with the previous GAM and SAM
iii. To determine the morbidity rates amongst children aged 6-59 months over a two week recall period
iv. To estimate the coverage of Measles, BCG vaccination and deworming for children 9-59 months, 6-59 months and 12-59 months respectively
v. To determine the coverage for zinc supplementation and vitamin A supplementation among the children 6-59 months
vi. To estimate the nutritional status of female caregivers aged 15-49 years using MUAC measurements
vii. To assess household food security and livelihoods
viii. To assess water sanitation and hygiene practices

1.3 Timing of the Survey

The survey was undertaken from 22nd January, 2018. Training and piloting of the survey materials and standardization test was conducted from 22nd to 25th January, 2018 and thereafter data collection from 26th January, 2018. This survey was conducted in the middle of the short dry period as shown in the section below:

1.4 Seasonal Calendar

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Short Dry Season			**Long Rain**			**Long dry spell**			**Short Rains**		

CHAPTER TWO

2.0 Methodology

2.1 Geographic Target Area and Population Group

The survey was conducted in the Marsabit County and covered two sub-counties; North Horr and Laisamis. This was based on an emergency response initiated by UNICEF due to the prevailing hunger and drought reported in the neighboring counties evidenced by the high prevalence of malnutrition. Each of the sub-counties had its own independent sample. The primary respondent for the survey was the mother/care taker of the child for both household and child questionnaire

Data was collected on the following variables; anthropometry, morbidity, vaccination and de-worming status, Vitamin A supplementation, hygiene and sanitation practices. Other indicators assessed were, household food security and livelihood. In addition, the nutritional status of child aged 6 – 59 months mother/care taker aged 15 – 49 years was also determined.

2.2 Survey Design

The survey applied a two stage stratified cluster sampling using the SMART methodology with the clusters being selected using the probability proportional to population size (PPS). Stage one sampling involved the sampling of the clusters to be included in the survey while the second stage sampling involved the selection of the households from the sampled clusters.

2.3 Study Population

The target population for the survey was children aged 6 – 59 months for the anthropometric component and women of reproductive age between 15 – 49 years for the maternal health component.

2.4 Anthropometric Sample Size

The anthropometric survey sample size was calculated using the SMART survey calculator. The parameters of interest were captured in the ENA version 9th July software and the respective number of children and households required for the survey computed. The sampling frame for this survey was the updated list of villages (with current projected population) from the survey area.

Table 1: Anthropometric Sample Size for the North Horr and Laisamis survey

	North Horr	Laisamis	Total	Rationale
Estimate (GAM)	31.0%	24.8%		From 2017 SMART survey
Precision	5.0%	5.0%		From SMART Global project (Rule of thumb)
Design Effect	1.4	1.4		From 2017 SMART Survey to cater for heterogeneity
Estimated Number of Children	**501**	**437**	**938**	
Average HH Size	5.6	5.6		From the previous 2017 Survey
Non-Response Rate	3.0	3.0		Based on 2017 SMART Survey Experience

Proportion of Children Under 5	16.5%	15.7%		From DHIS
Estimated Number of Households	**621**	**569**	**1190**	
Number of Households per Day	15	14		Based on 2017 SMART Survey Experience
Number of Cluster	42	42	84	Computed from the Number of HHs per Day
Number of children per Cluster	12	11		
Number of Teams	7	7	14	
Number of Days	6	6		Based on the Number of Teams to be Recruited

Rationale for Parameters Used for the Survey

- ✓ GAM – 2017 SMART Survey for the two sub-counties but point estimate since the situation was expected to be stable.
- ✓ Precision –5.0 percent as recommended by the Nutrition Survey Guidelines 2012
- ✓ Design Effect – 1.4 based on the 2017 SMART Survey in the Survey Zones
- ✓ Non-Response Rate – 3.0 percent based on prior SMART survey experience in the same areas
- ✓ Average HH Size – Kenya Health Information System Population estimates
- ✓ Proportion of children under five years obtained from Kenya Health Information System population estimates
- ✓ Household to be sampled per day – based on the previous 2017 SMART survey experience and based on the number of teams to be recruited.

2.5 Cluster and Household Selection

All the villages that were accessible were included in the sampling Frame and sampled with probability proportional to size. At the second stage, each team listed all the households in a village and used the simple random sampling method in households to visit. Within the selected households all children 6-59 months fitting the inclusion criteria were measured.

A household was defined as a group of people who lived together and shared a common cooking pot. In polygamous families with several structures within the same compound but with different wives having their own cooking pots, the structures were considered as separate households and assessed separately.

In cases where there was no eligible child, a household was still considered part of the sample. If a respondent was absent during the time of household visit, the teams left a message and re-visited later to collect data for the missing person, with no substitution of households allowed.

2.6 Variables Collected

Age: the age of the child was recorded based on a combination of child health cards, the mothers'/caretakers' knowledge of the birth date and use of a calendar of events for the district developed in collaboration with the survey team.

Sex: it was recorded whether a child was male or female.

Bilateral Oedema*:* normal thumb pressure was applied on the top part of both feet for 3 seconds. If pitting occurred on both feet upon release of the fingers, nutritional oedema was indicated.

Weight: the weights of children were taken with minimal or light clothing on, using Bathroom scale (SECA digital model with a threshold of 150kgs and recorded to the nearest 0.1kg.

Length/Height: children were measured bareheaded and barefooted using wooden UNICEF height boards with a precision of 0.1cm. Children under the age of two years were measured while lying down (length) and those over two years while standing upright (height). If child age could not be accurately determined, proxy heights were used to determine cases where height would be taken in a supine position (<87cm) or in an upright position (≥87cm).

Mid Upper Arm Circumference (MUAC): the MUAC of children were taken at the midpoint of the upper left arm using a MUAC tape and recorded to the nearest 0.1cm.

Retrospective Morbidity of Children: A 2-week morbidity recall was conducted for all children (6-59 months) to assess the prevalence of common diseases (e.g. malaria, diarrhoea).

Vaccination Status and Coverage:

For all children 6-59 months, information on BCG, Oral polio Vaccine (OPV) 1, OPV 3 and measles vaccination was collected using health cards and recall from caregivers. The vaccination coverage was calculated as the proportion of children immunized based on card and recall.

Vitamin A Supplementation Status: For all children 6-59 months of age, information on Vitamin A supplementation was collected using the child welfare cards and recall from caregivers. Information on whether the child had received supplementation in the last 6 months was collected. Vitamin A capsules were also shown to the mothers to aid in recall.

De-worming Status: Information was solicited from the care takers as to whether their child/children 6-59 months had been de-wormed in the last 6 months.

Household Food Diversity: Dietary diversity is a qualitative measure of food consumption that reflects household access to a wide variety of foods, and is also a proxy of the nutrient intake adequacy of the diet for individuals. Dietary diversity scores were created by summing the number of food groups consumed over a 24- hour period to aid in understanding if and how the diets are diversified. Household dietary diversity score (HDDS) is meant to reflect, in a snap shot the economic ability of a household to consume a variety of foods. A score of 1 was allocated to each food group that was consumed by the household and a score of 0 for each of the food groups not consumed by the household, and thus the highest possible score was 12.

Household Water Consumption and Utilization: The indicators used were main source of drinking and

household water, time taken to water source and back, cost of water per 20-litre jerry-can and treatment given to drinking water.

Sanitation: Information on household accessibility to a toilet/latrine, disposal of children's faeces and occasions when the respondents wash their hands was obtained.

2.7 Organization of the Survey

- **Coordination/Collaboration:** before the survey was conducted meetings were held with the respective county authorities and key stakeholders briefed them about the purpose, objectives and methods for the survey. The survey details were discussed with the County Steering Group, the National Draught Management Authority, key partners on the ground (NGO and UN) and conducted in collaboration with the County and Sub-Counties Health Offices. The authorities were requested to officially inform the communities (villages) that were involved in the assessment.
- **Recruiting the Survey Team:** recruitment was done by the Ministry of Health office at the County level in order to give ownership and participation in the assessment.
- **Training of the Survey Team:** the teams were given 4-days training prior to field work, including a standardization test to ensure standardization of measurement and recording practice. All data collectors were trained on taking anthropometric measurements, completion of questionnaires and sampling methodology. The data collection forms and questionnaires were pilot tested in clusters not selected to be part of the larger survey, to ensure that the interviewers and respondents understand the questions and that interviewers follow correct protocols. One training was conducted and facilitated by Ministry of Health and Nutrition Information Working Group supported by Concern Worldwide, World Vision and Food for the Hungry.
- **Team work in the field:** The teams each with four members who have experience in data collection were organized/ selected from the survey area with each team consisting of 1 team leader, interviewer and 2 measurers. In addition, supervisors from MoH, NDMA, World Vision, Concern Worldwide, and Food for the Hungry, closely supervised the team throughout the survey. In moving from one randomly selected household to another, the teams were guided by a village leader, or a community volunteer, depending on the village and who was available.

2.8 Data Entry, Analysis and Report Writing

- **Data Analysis:** the data downloading and analysis was done using ENA for SMART, Excel and SPSS Statistical software version 17. The Concern Worldwide Survey and Surveillance Officer and Monitoring and Evaluation Officer of World Vision were responsible for the Data downloading, analysis and report writing. Results are presented using the new WHO reference levels.
- **Preliminary Results and Final Report:** the preliminary findings were submitted by Survey and Surveillance Officer of Concern Worldwide and Monitoring and Evaluation Officer of World Vision to the CHMTs, stakeholders and the Nutrition Information Working Group (NIWG) within two weeks of completion of the survey fieldwork at County and National level and included the prevalence of global acute malnutrition as well as the prevalence of moderate and severe acute malnutrition, vaccination and other relevant information.

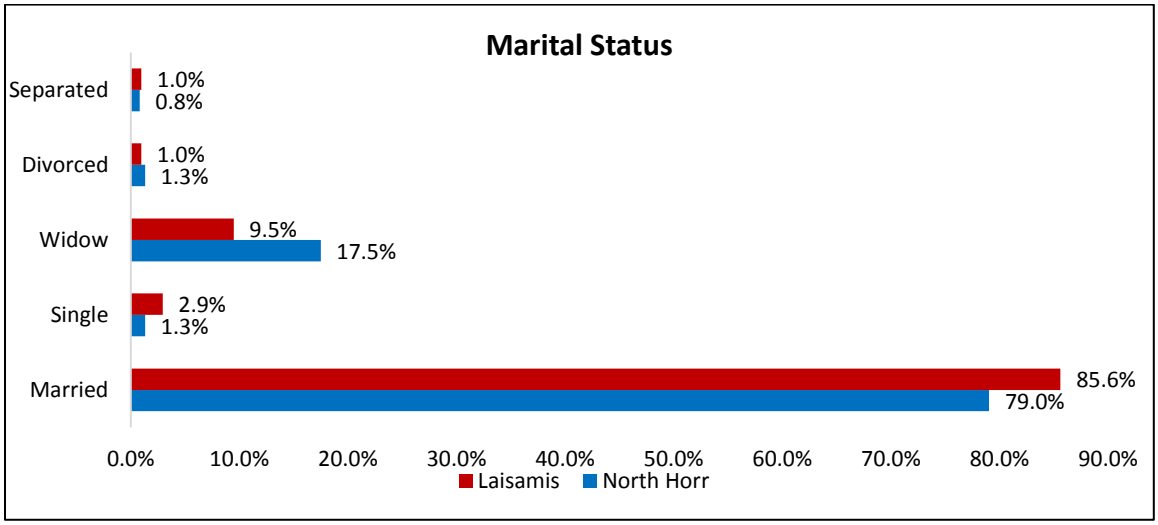
CHAPTER THREE

3.0 SURVEY RESULTS AND DISCUSSION

3.1 Demographic Results

99% the respondents from households in Laisamis and North Horr were residents. Majority of the respondents were married but it's worth noting also Widow are increasing especially in North Horr Sub County with almost 20% as shown in the figure below:

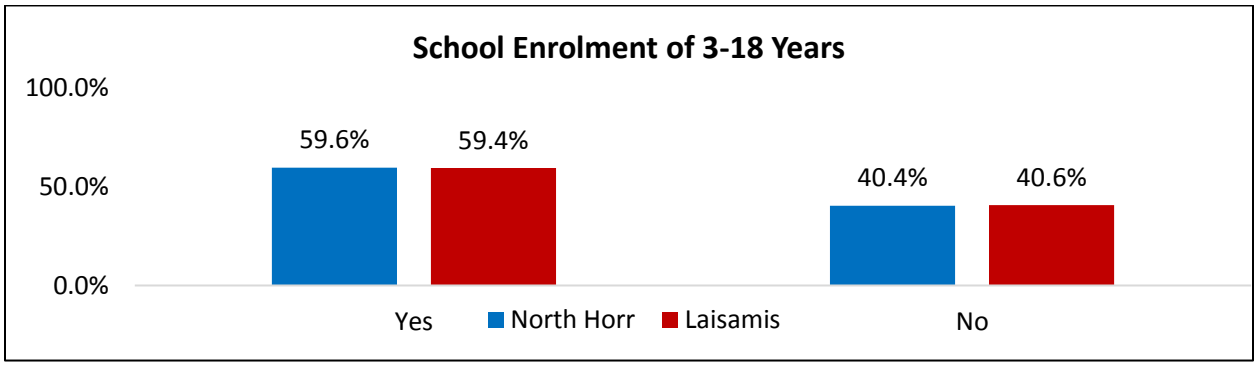
Figure 2: Respondents Marital Status



3.2.1 School Enrolment for 3-18 Years Age group

In both North Horr and Laisamis Sub Counties, around 60% of the children aged 3-18 Years of age were enrolled to school as shown in the graph below:

Figure 3: School Enrolment



In comparison with the survey conducted in July 2017 where enrollment was at 53.0% and 54.6% in North Horr and Laisamis respectively, enrolment as increased which could be attributed to the construction of more ECD centres and hiring of more ECD teachers and government policy of 100 percent transition and Free Day Secondary School Education which came into effect in January 2018.

The major reason for the 40% not being in school was, family responsibilities such as herding and the children are very Young to be in School because culturally in both North Horr and Laisamis Sub Counties children enroll to schools at the age 5 years.

Table 2: Reason for not being at school (3-18 Years)

Reason for not being at school (3-18 Years)		
	North Horr	Laisamis
Chronic Sickness	0.4%	1.7%
Weather	0.2%	0.2%
Family labour Responsibilities i.e. Herding	48.7%	55.1%
Working outside home	1.2%	0.2%
Too poor to buy school items	2.7%	1.5%
Household doesn't see value of schooling	6.6%	5.0%
No food in the school	0.2%	0.2%
Migrated /moved from school area	5.8%	0.6%
Insecurity	0.6%	0.4%
No school near by	11.2%	11.1%
Married	3.5%	0.8%
Young	16.8%	21.5%

3.2.2. Highest Education Level for people above 18 years of age

As shown in the figure below, over 80.0% of people above 18 years of age in North Horr and Laisamis Sub Counties had no formal education while 7.6% and 5.8% had primary Education in North Horr and Laisamis Sub Counties respectively. It's also worth noting that 3.8 % and 2.0% in North Horr and Laisamis sub Counties respectively had tertiary education.

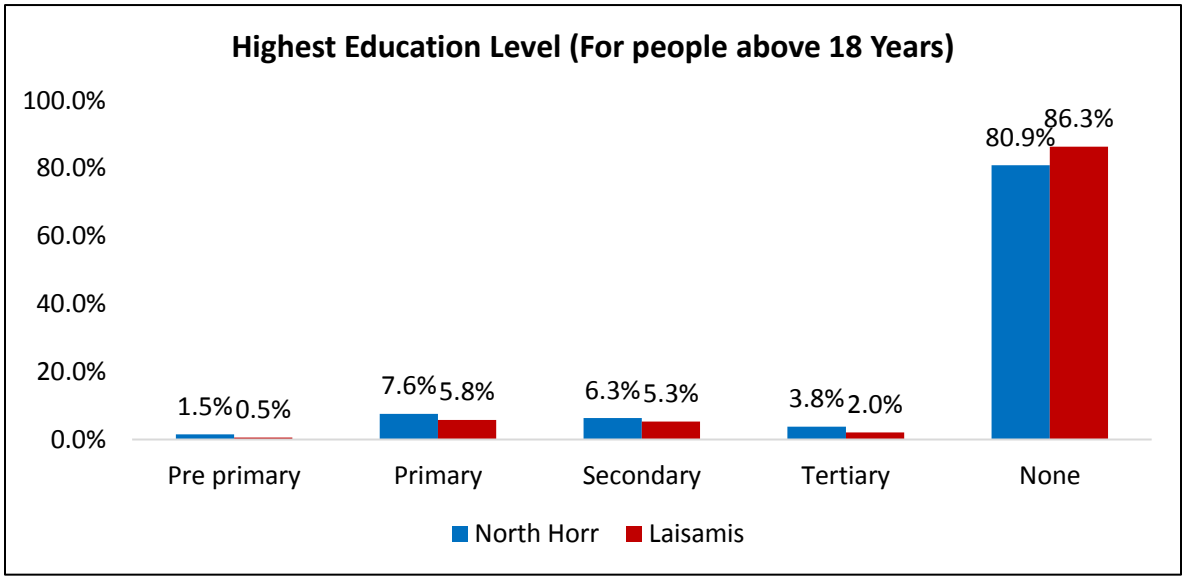
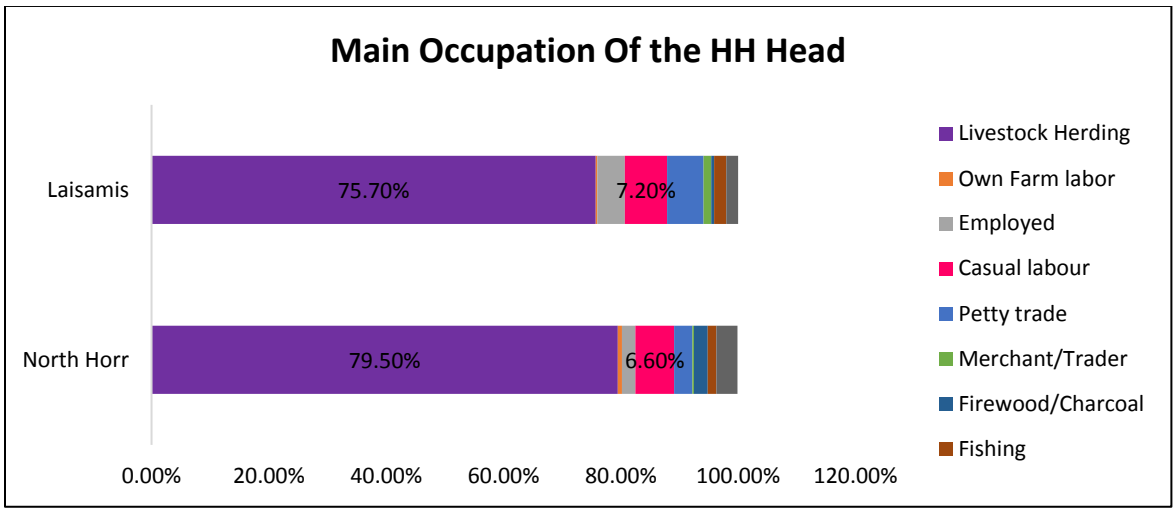


Figure 4: Highest Education Level for the people above 18 years of age

3.3 Main Occupation of the Household head

The main source of Livelihood of the Household Head in Laisamis and North Horr is livestock herding at 75.7% and 79.5 % respectively which is a decline compared to survey conducted in July 2017 from 85.9% and 82.3% which is attributed to the intense drought situation that hit both sub counties. It's worth noting that also nearly 7% their main livelihood is casual labor followed by petty trade.

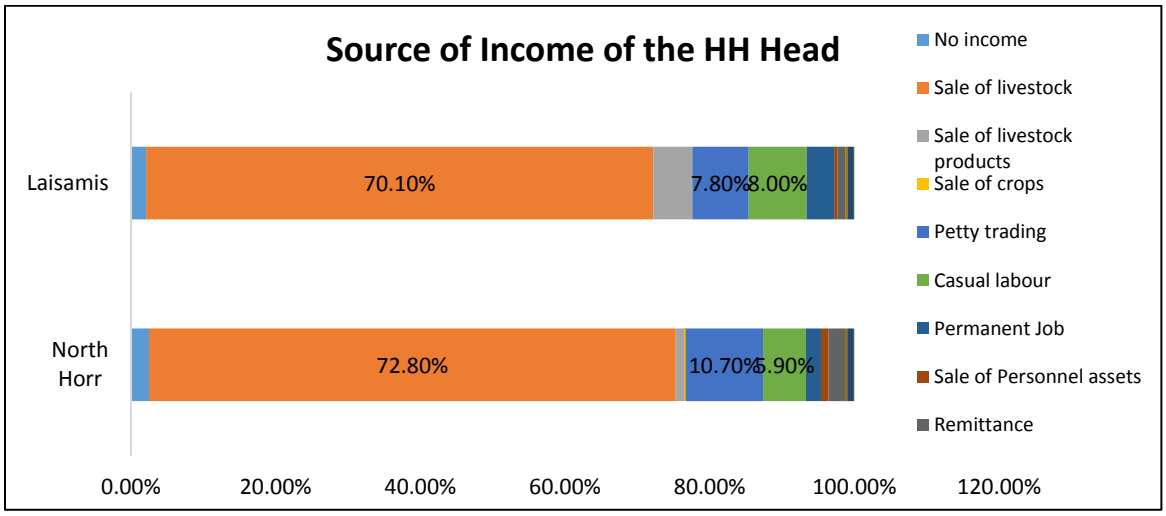
Figure 5: Main Occupation of the HH Head



3.4 Main Source of income of the Household Head

In Marsabit County Livestock production contributes to 80 percent of household cash income in the pastoral livelihood zone and 60 percent to the agro-pastoral livelihood zone. The main source of income of the Household Head in Laisamis and North Horr is sale of livestock at 70.1% and 72.8 % respectively followed by petty trade then Casual labor. This is a great improvement from the survey done in July 2017, most households in Laisamis and North Horr had no source of Income at 81.1% and 81.3% respectively.

Figure 6: main Source of Income of the HH head



3.5 Nutritional Status of Under-Five Children

3.5.1 Prevalence of acute malnutrition (weight-for-height z-score –WHO Standards 2006)

The survey managed to reach a total of 527 and 445 children aged between 6 to 59 months in Laisamis and North Horr Sub Counties respectively whose anthropometric measurements were taken.

In this survey, GAM was defined as the proportion of children with a z-score of less than -2 z-scores weight-for-height and/or presence of bilateral oedema. Severe Acute Malnutrition (SAM) was defined as the proportion of children with a z-score of less than -3 z-score and/or presence of oedema.

Further, using the mid-upper arm circumference (MUAC), GAM was defined as the proportion of children with a MUAC of less than 125 mm and/or presence of oedema while SAM was defined as the proportion of children with a MUAC of less than 115 mm and/or presence of oedema.

Malnutrition by Z-Score: WHO (2006) Standard

- Severe acute malnutrition is defined by WFH < -3 SD and/or existing bilateral edema on the lower limbs
- Moderate acute malnutrition is defined by WFH < -2 SD and >-3 SD and no edema
- Global acute malnutrition is defined by WFH < -2 SD and/or existing bilateral edema

Malnutrition by MUAC

- Severe malnutrition is defined by MUAC<115 mm and/or presence of bilateral edema
- Moderate malnutrition is defined by MUAC < 125 mm and ≥115 mm and no edema
- Global acute malnutrition is defined by MUAC <125 mm and/or existing bilateral edema

The Global Acute malnutrition levels in Laisamis, North Horr, Sub Counties were above the emergency GAM thresholds (15.0%) indicating a critical situation. North Horr Sub County recorded the highest level of malnutrition of 21.8 percent (95% C.I 18.0-26.1) with Laisamis Sub County at 21.2 percent (95% CI: 17.3-25.7).

The nutrition situation is interpreted as very critical in North Horr and Laisamis Sub Counties with the GAM rates being >20%. In relation to the children who were severely malnourished, the nutrition situation in Laisamis and North Horr is classified as critical. The classification is based on the WHO growth standards. There were no cases of edema that were reported.

There was a drop in GAM rates for North Horr and Laisamis sub counties from 2017 levels which were at 31.5% and 24.7% to January 2018 which can be attributed to scaling up of nutrition response activities such as mass screening, robust emergency response strategy mounted by partners led by Ministry of Health through Blanket Supplementary Feeding Programme (BSFP) and integrated health and nutrition outreaches. The situation was also boosted by better performance of the short rains season late last year which was enhanced rainfall amounting to 125 to 200 percent of normal short rains in northern parts of the county including North Horr, Maikona, Illeret and Dukana and the lower parts of the county including Loiyangalani and Laisamis received below normal rains at 50 to 75 percent thereby resulting to availability of food at household level improving the food consumption.

Although the situation improved the malnutrition levels still remain high in North Horr and Laisamis sub counties can be attributed to increased incidences of diseases amongst under-fives, and low milk production and consumption and poor infant feeding practices. According to NDMA bulletin January 2018 where Milk production was reported in less than 20 percent of the households which is below normal, where available, production ranged from 0.5 - 1 liter per household per day compared to normally 2-3 liters per household per day. Also according to MIYCN KABP conducted in October 2017, minimum dietary diversity for children 6-23 months was 5.3% and 4.8% in Laisamis and North Horr Sub Counties respectively, minimum Acceptable diet was 5.4% and 4.8% in Laisamis and North Horr Sub Counties respectively and Minimum meal frequency was 0.0% in both Sub Counties which were very low. This was attributed to complementary foods not being adequate due to prolonged drought that had killed livestock leading to lack of food and also reduces purchasing power of a household.

Table 3: Prevalence of acute malnutrition by WHZ

	North Horr January 2017	North Horr January 2018	Laisamis January 2017	Laisamis January 2018
Global Acute Malnutrition (GAM)	31.5% (25.3-38.5)	21.8% (18.0-26.1)	24.7% (19.3-31.0)	21.2% (17.3-25.7)
Severe Acute Malnutrition (SAM)	9.8% (6.6-14.3)	5.2% (3.4- 7.9)	5.5% (3.5- 8.5)	3.3% (2.1- 5.1)
% of Oedema	0.0%	0.0%	0.0%	0.0%

3.5.2 Prevalence of Acute malnutrition by MUAC

The nutrition situation was also assessed using the MUAC and in comparison with the GAM rates by the WFH scores. The prevalence of Acute Malnutrition by MUAC for North Horr Sub County was 10.1% and for Laisamis Sub County was 7.1% which is at *emergency*[7] according to WHO classification. According to NDMA Bulletin January 2018, the Proportion of children 'at risk' of malnutrition was 20.8 percent compared to the long term average of 22 percent and 21.7 percent same period last year. Illeret, Korr and Loiyangalani (Laisamis) reported emergency levels which had surpassed the normal thresholds according to NDMA Long term Average of 22 Percent.

[7] MUAC WHO Cut-Offs: <2 – Low, 2 – <4 – Medium, 4 and above - Emergency

Table 4: Prevalence of acute Malnutrition by MUAC

	North Horr January 2017	North Horr January 2018	Laisamis January 2017	Laisamis January 2018
Global < 125mm	10.1% (6.7-14.9)	3.4% (1.9- 5.8)	7.1% (3.8-12.9)	6.8% (4.5-10.3)
Severe under nutrition <115mm	0.9% (0.3- 3.0)	0.2% (0.0- 1.7)	1.2% (0.4- 3.2)	0.6% (0.2- 1.7)

3.5.3 Prevalence of Underweight

The prevalence of underweight is determined by low weight-for-age which arises from insufficient weight gain relative to age is a function of short stature, thinness or both. Underweight prevalence for Laisamis Sub County was 34.4% and North Horr Sub County was at 26.5%.

Table 5: Prevalence of Underweight

	North Horr January 2017	North Horr January 2018	Laisamis January 2017	Laisamis January 2018
Global underweight	36.5% (30.5-43.0)	26.5% (22.1-31.3)	40.0% (33.6-46.9)	34.4% (28.7-40.7)
Severe Underweight	8.7% (5.6-13.2)	5.4% (3.6- 8.1)	12.0% (8.5-16.5).	8.5% (5.9-12.1)

The high prevalence of underweight in Laisamis and North Horr Sub counties is consistent with wasting prevalence an indication of same cause mainly of drought condition being experienced hence limited access to market to buy food for consumption, which was affected with insecurity especially in Laisamis and poor access to health service delivery points due to poor community referral system and also the vastness of the county has limited scope of health facilities and with limited visits to far health facilities by the County Health Management Team (CHMT) like Illeret Health Centre in North Horr Sub County.

3.5.4 Prevalence of Stunting

Height-for-age is another anthropometric indices commonly used as an indicator for malnutrition. Stunting (low height-for-age), results from extended periods of inadequate food intake, poor dietary quality, increased morbidity, or a combination of the above factors. Stunting in childhood leads to

reduced adult size and reduced work capacity. This, in turn, has an impact on economic productivity at the national level. The prevalence of stunting in North Horr Sub County was 19.9% and in Laisamis Sub County was 29.8%.

Table 6: Prevalence of Stunting

	North Horr January 2017	North Horr January 2018	Laisamis January 2017	Laisamis January 2017
Global Stunting	23.5% (19.5-28.1)	19.9% (16.0-24.3)	31.4% (25.9-37.4)	29.8% (24.6-35.5)
Severe Stunting	4.9% (2.8- 8.2)	4.4% (2.6- 7.4)	9.6% (6.4-14.1)	8.9% (6.1-12.9)

The stunting levels were within the medium ranges in Laisamis and low in North Horr which could be attributed to the poor dietary intake both in terms of quantity and quality as evidenced in MIYCN KABP conducted in October 2017, minimum dietary diversity for children 6-23 months was 5.3% and 4.8% in Laisamis and North Horr Sub Counties respectively, minimum Acceptable diet was 5.4% and 4.8% in Laisamis and North Horr Sub Counties respectively and Minimum meal frequency was 0.0% in both Sub Counties which were very low. This was attributed to complementary foods not being adequate due to prolonged drought that had killed livestock leading to lack of food and also reduces purchasing power of a household. And also the household dietary diversity score which showed that the survey population relied heavily on 4 major food groups (cereals, legumes, fats & oils and sugars) which are predominantly high in energy but lack in the essential micronutrients required for proper growth and development mainly found in vegetables, fruits and protein-rich foods of animal sources e.g. meat, eggs, fish etc.

3.6 Maternal Nutrition Status

Pregnancy imposes a big nutrient-need load on mothers, which in the absence of adequate extra nutrients leads to utilization of body nutrient reserves leading to malnutrition. Gestational malnutrition leads to low birth weights and may ultimately culminate in poor child growth and development, thus there is an urgent need to address high rates of malnutrition among pregnant women. Household food insecurity is a key indicator/determinant for poor adult nutritional status. A high number of malnourished PLWs increase the risk of growth retardation of the fetus and consequently an increase in low birth weight and malnutrition burden spreads to both U5 children and caretakers from the same household faced with food insecurity and related vulnerabilities, a common scenario during nutrition emergency levels .

3.6.1 Women physiological status

The figure below indicates that majority of the surveyed women of Reproductive age (15-49 years) in the North Horr Sub county 56.1% were lactating while in Laisamis it was 53.6%.14.0% and 12.4% of the women of reproductive age were pregnant in North Horr and Laisamis respectively.

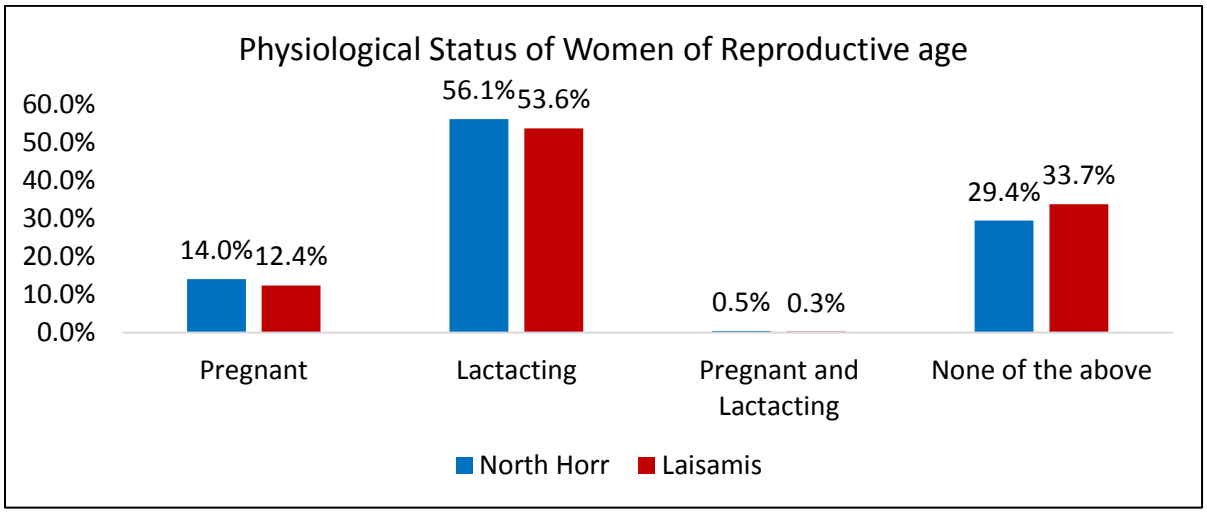
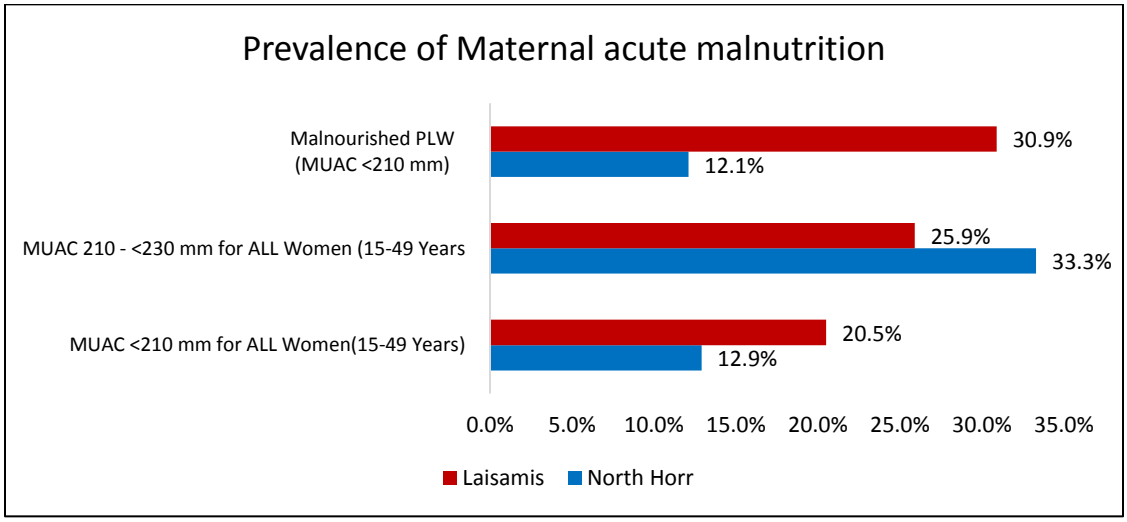


Figure 7: Physiological status of Women of reproductive age

3.6.2 Acute Malnutrition

Maternal malnutrition is usually associated with high risk of low birth weights and it is recommended that before, during and after birth, the maternal nutrition status should be adequate. The following graph depicts the maternal nutrition situation of the women of the reproductive age and pregnant and lactating women in the two Sub counties.

Figure 8: Maternal Nutrition by MUAC



The maternal malnutrition was defined as women whose MUAC measurements were < 21.0cm while women whose MUAC measurements were between 21.0 <23.0cm were classified as at risk of malnutrition.

The proportion of malnourished pregnant and lactating women in Laisamis and North Horr sub counties was 30.9% and 12.1% respectively. According to the results pregnant and lactating women in Laisamis are ore affected with malnutrition which according the NDMA January 2018 there was a drop in the mean food consumption from December at 39.5 to 37.6 which was mainly attributed to reduced amounts of food consumed, poor dietary diversity and reduced frequency of meals.

The Proportion of Malnourished women of reproductive age in Laisamis and North Horr sub counties was 25.9% and 33.3% respectively.

The proportion of women of reproductive age at risk in Laisamis and North Horr sub counties was 20.5% and 12.9% respectively.

3.6.3. Iron Supplementation

During pregnancy, women have increased need for additional iron to ensure they have sufficient iron stores to prevent iron deficiency. Iron supplementation is recommended in resource limited settings as strategy to prevent and correct iron deficiency and anaemia among pregnant women WHO recommends daily consumption of 60mg elemental iron and 0.4mg folic acid throughout the pregnancy.[8] Iron and folic acid supplementation has been the preferred intervention to improve iron stores and prevent anaemia among pregnant women, and it may also improve other maternal and birth outcomes. These recommendations have since been adopted by Kenya government in its 2013 policy guidelines on supplementation of iron folic acid supplementation (IFAS) during pregnancy. During the survey, iron folic supplementation was assessed by asking mothers of children below 2 years if they consumed iron folate in their most recent pregnancy. Results show that in both Sub Counties is yet to achieve the target for IFAS, most of the caretakers took IFAS tablets less 90 Days in both sub counties which could be attributed to side effects of the supplements. According to the women, IFAS has an unpleasant smell that makes them feel nauseated, hence they end up not completing the dose given. The other side effect reported were a feeling of metallic taste in the mouth and increased heartbeat. Also the possibly of operational shortfalls in the delivery of the product or health seeking behaviour where mother seek ANC services late in their last trimester.

From the survey results, 79.7% (n=204) and 81.5% (176) of caretakers with children aged 24 months and below were supplemented with Iron Folic acid in their last pregnancy in Laisamis and North Horr Sub Counties respectively.

The mean number of days IFAS was consumed by the women varied by sub-county i.e. the mean number of days IFAS was consumed by women: Laisamis 44.6 and North Horr 36.6 respectively. This is as summarized in the table below:

[8] WHO. Guideline: Daily iron and folic acid supplementation in pregnant women. Geneva, World Health Organization, 2012.

Table 7: IFAS Consumption by Days

Zone	North Horr		Laisamis	
Categories of IFAS Consumption (In Days)	N	%	N	%
< 90 Days	168	95.5%	164	80.4%
90≥180 Days	8	4.5%	39	19.1%
> 180 Days	0	0.0%	1	0.5%

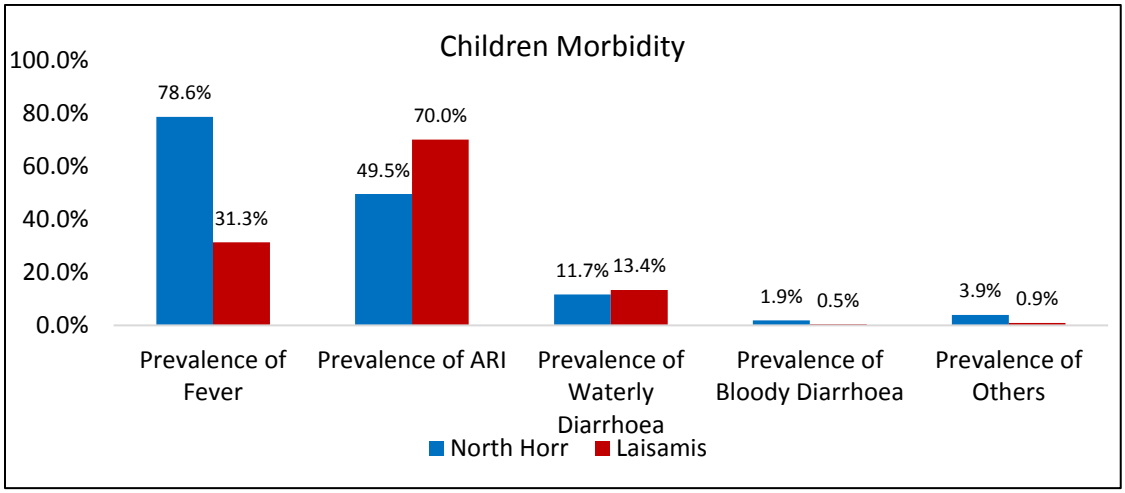
3.7 CHILD HEALTH AND IMMUNIZATION

3.7.1 Morbidity and Health Seeking Behaviour

More than half of under-5 child deaths are due to diseases that are preventable and treatable through simple, affordable interventions. Strengthening health systems to provide such interventions to all children will save many young lives.

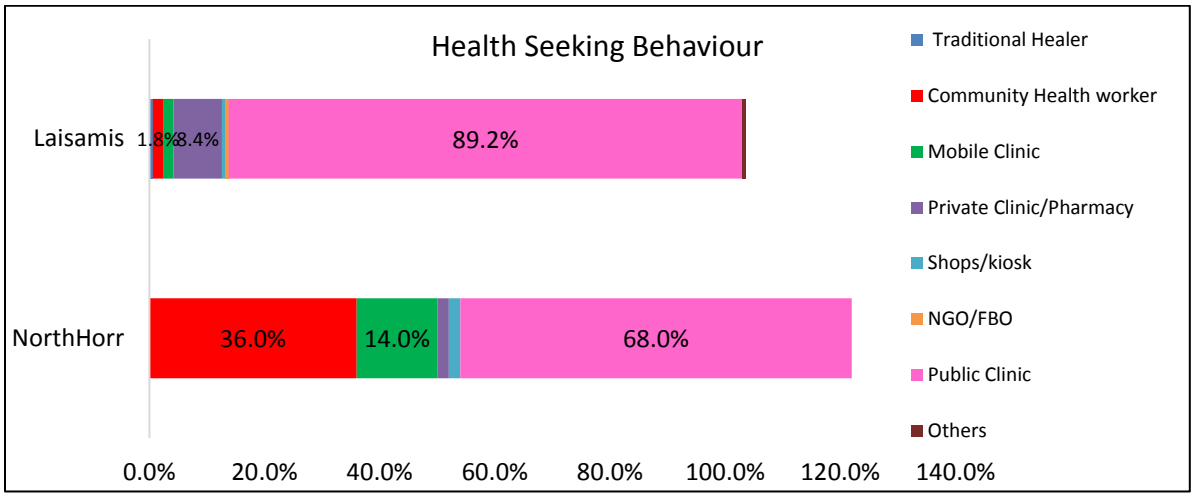
The morbidity of the children in the survey area was determined within a 2 week recall period. 22.7% (103) and 39.6% (217) of children in North Horr and Laisamis respectively were reported to have been ill two weeks prior to survey. Upon further analysis, it was found out that the leading causes of morbidity in North Horr was fever which accounted for 78.6% of the cases while in Laisamis was acute respiratory infections- ARI which accounted for 70.0% of the cases. The prevalence of watery diarrhoea was reported highest in Laisamis at 13.4%. The prevalence of bloody diarrhoea was also reported in North Horr and Laisamis at 1.9% and 0.5% respectively. This is depicted in the graph below.

Figure 9: Children Morbidity



In terms of the health seeking behaviour of the caregivers who had sick children with a period of 2 weeks before the survey, 48.5%(50) and 77.0%(167) of caregivers reported to have sought medical assistance when their children were ill in North Horr and Laisamis respectively. Around 50% in North Horr sought medical assistance which is less compared to Laisamis which could be associated with access to health facility.

Figure 10: Health seeking Behavior



Most caregivers sought medical assistance when their children were ill from Public Clinic at 89.2% and 68.0% of the caregivers in Laisamis and North Horr respectively. 36.0% of the caregivers in North Horr sought assistance from Community Health workers and 14.0% from mobile clinic (Outreaches). In Laisamis 8.4% of the caregivers sought medical assistance from Private clinic/Pharmacy.

3.7.2 Immunization Coverage

Immunisation is a simple and effective way of protecting children from serious diseases. It not only helps protect individuals, it also protects the broader community by minimising the spread of disease. Vaccines work by triggering the immune system to fight against certain diseases. If a vaccinated person comes in contact with these diseases, their immune system is able to respond more effectively, preventing the disease from developing or greatly reducing its severity. High immunisation rates in the community have led to many of diseases becoming rare. However, they still exist and the risks of side-effects or complications from these diseases are far greater than the very small risks of side effects from vaccination.

The survey used three antigens as a proxy for immunization coverage. These were; BCG, Oral Polio vaccination (1 and 3) and measles vaccine (1 and 2).

The immunizations to the children were ascertained either by card (mother-child booklet) or by recall. The 1st measles immunizations coverage at 9 months by card/recall was 89.9% and 89.0% for Laisamis and North Horr respectively which was above 80% the National Target. For the 2nd measles immunizations coverage at 18 months by card/recall was 77.1% and 74.8% for Laisamis and North Horr Sub counties. For BCG vaccination which was ascertained by scar, the coverage performed quite well in the two sub-counties with all of them attaining the 80% national coverage targets.

For the OPV1 by card/recall was 83.4% and 93.8% for North Horr and Laisamis Sub Counties respectively. For OPV3 by card/recall was 92.1% and 92.2% for North Horr and Laisamis Sub counties respectively.In North Horr there was poor coverage of OPV1 which could be attributed to poor documentation.

Table 8: Immunization Coverage

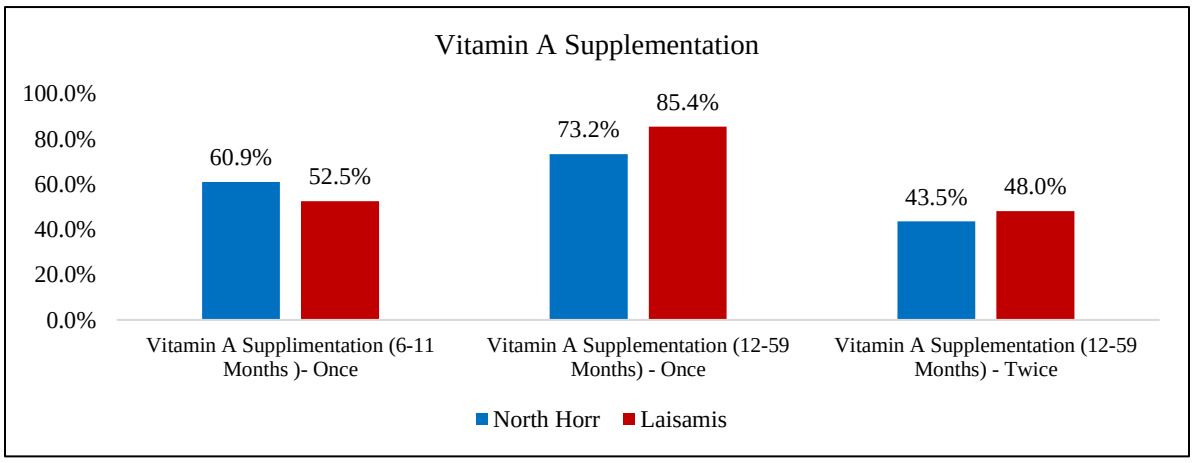
Survey zone	North Horr			Laisamis		
Indicator	n	N	%	n	N	%
Measles at 9 Months (Yes by Card)	264	437	60.4%	386	518	74.5%
Measles at 9 Months (Yes by Recall)	125	437	28.6%	80	518	15.4%
Measles at 18 Months (Yes by Card)	177	358	49.4%	225	397	56.7%
Measles at 18 Months (Yes by Recall)	91	358	25.4%	81	397	20.4%
BCG by Scar	415	453	91.6%	517	548	94.3%
OPV 1 (Yes by Card)	290	453	64.0%	430	548	78.5%
OPV 1 (Yes by Recall)	133	453	29.4%	84	548	15.3%
OPV 3 (Yes by Card)	292	453	64.5%	423	548	77.2%
OPV 3 (Yes by Recall)	125	453	27.6%	82	548	15.0%

3.7.3 Zinc & Vitamin A Supplementation and Deworming Coverage

Vitamin A supplementation among children below the age of 5 years offers protection against common childhood infections and substantially reduces mortality hence improving the child's survival. Vitamin A supplementation coverage was determined both for over the last six months and one year for all the surveyed areas. From the findings, Vitamin supplementation for children aged 12-59 months who had received Vitamin A twice was 43.5% and 48.0% for North Horr and Laisamis respectively.

The findings are summarized the graph below

Figure 11: Vitamin A supplementation Coverage



In low- and middle-income countries, millions of children suffer from severe diarrhoea every year and many die from dehydration. Giving fluids by mouth (using an oral rehydration solution (ORS)) has been shown to save children's lives, but it has no effect on the length of time the children suffer with diarrhoea. Zinc supplementation could help reduce the duration and the severity of diarrhoea, and therefore have an additional benefit over ORS in reducing children mortality. With regard to Zinc supplementation, Laisamis had the coverage at 75.7 %(22) while North Horr had the coverage of 41.7% (5).

Table 9: Zinc Supplementation

	North Horr			Laisamis		
	n	N	%	n	N	%
Prevalence of Watery Diarrhea	12	103	11.7%	29	217	13.4%
Prevalence of Bloody Diarrhea	2	103	1.9%	1	217	0.5%
Zinc Supplementation	5	12	41.7%	22	29	75.7%

Deworming supplementation is also an important practice that gets rid of worms that compete for nutrients in the body and causing iron deficiency anaemia. For deworming of children aged 12-59 months, the coverage was 58.7% (239) and 60.2 %(293) for North Horr and Laisamis respectively.

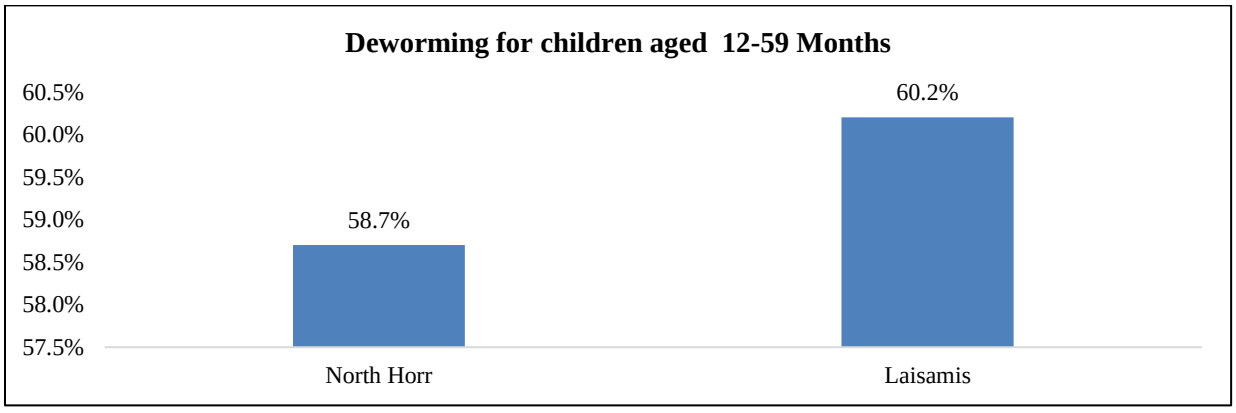


Figure 12: Deworming for children aged 12- 59 months

3.8 Household Water Access Sanitation and Hygiene

3.8.1 Main Sources of Drinking Water

Accessibility to improved water sources is of fundamental significance to lowering the faecal risk and frequency of associated diseases. Its association with other socioeconomic characteristics, including education and income, makes it a good universal indicator of human development. Drinking water coverage is presented as a two-step ladder that includes the proportion of the population using:

- Unimproved drinking water sources which include: Unprotected dug well, unprotected spring, cart with small tank/drum, tanker truck, and surface water (river, dam, lake, pond, stream, canal, irrigation channels), bottled water
- Improved drinking water sources also piped water which include: Public taps or standpipes, tube wells or boreholes, protected dug wells, protected springs and rainwater collection, Piped household water connection located inside the user's dwelling, plot or yard.

According to the table below 22.4% and 64.9% in North Horr and Laisamis Sub counties reported to, get water from improved drinking water sources while 77.6% and 35.1% in North Horr and Laisamis reported to get water from unimproved water sources. This is as shown by the table below:

Figure 13: main source of drinking water

Main Source of Drinking Water	North Horr	Laisamis
Piped into dwelling	0.0%	5.2%
Piped to yard/plot	0.0%	1.8%
Piped to Neighbor	0.0%	4.2%
Public tap/standpipe	1.7%	10.9%
Tube well/Borehole	15.3%	40.2%
Protected well	5.4%	2.6%
Unprotected well	40.3%	19.6%
Unprotected spring	0.5%	0.0%
Rain water	2.3%	2.5%
Tanker truck	2.3%	0.2%
Cart with small tank	0.0%	0.2%
Water Kiosk	12.4%	1.3%
Surface water	17.2%	10.1%
Others i.e. Underground tanks	2.6%	1.3%

3.8.2 Trekking distance to Water point

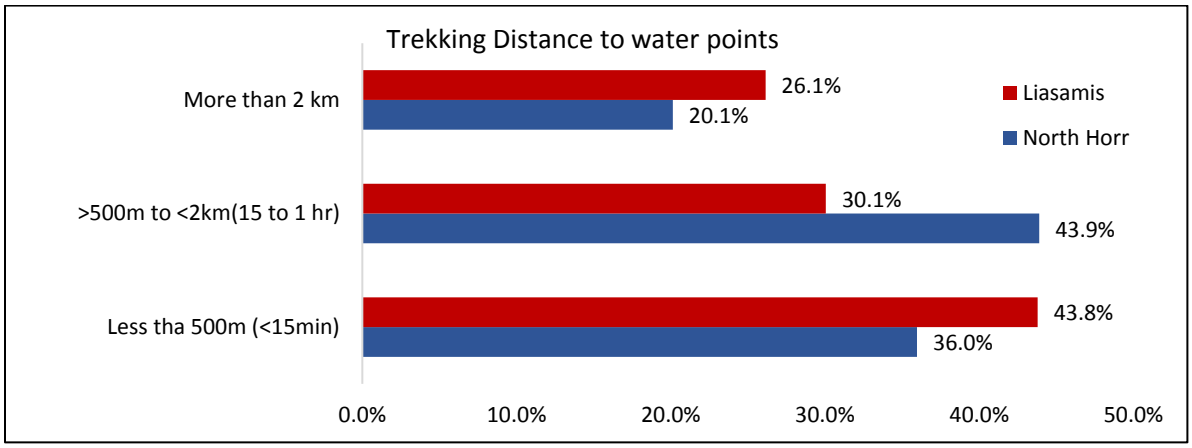
Currently, more than two-thirds of the population in Africa must leave their home to fetch water for drinking and domestic use. The time burden of water fetching has been suggested to influence the volume of water collected by households as well as time spent on income generating activities and child

care. However, little is known about the potential health benefits of reducing water fetching distances.[9] Time spent walking to a household's main water source was found to be a significant determinant of under-five child health. A 15-minutes decrease in one-way walk time to water source is associated with a 41% average relative reduction in diarrhoea prevalence, improved anthropometric indicators of child nutritional status, and an 11% relative reduction in under-five child mortality. These results suggest that reducing the time cost of fetching water should be a priority for water infrastructure investments.[10]

The distance covered to access water sources is a proxy indicator for water accessibility for a significant proportion of households in the sub-counties where the survey was administered.

The trekking distances varied in both sub-counties with North Horr and Laisamis almost 50% of the population trekking >500m to <2km and <500m respectively. This is as shown in the graph below:

Figure 14: Trekking distance to water points



3.8.3 Queuing time at water points

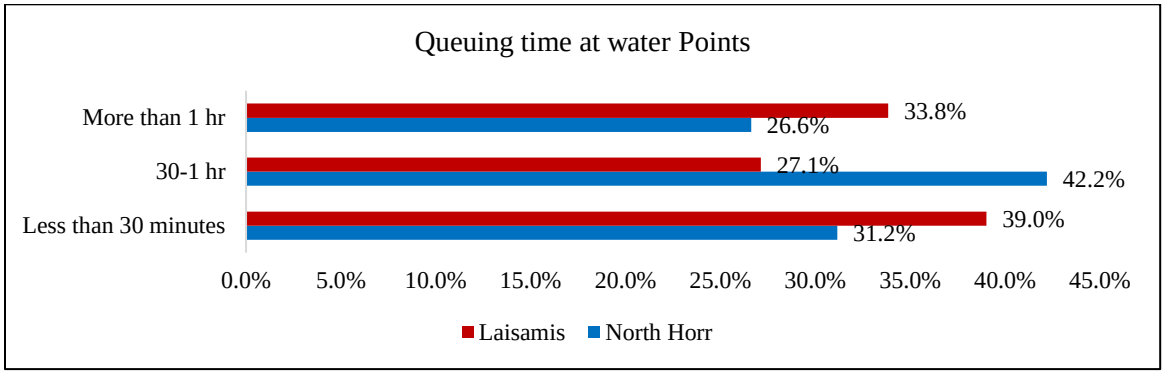
Excessive queueing times are indicators of insufficient water availability due to either an inadequate number of water points or inadequate yields at water sources. The potential negative results of excessive queueing times are reduced per capita water consumption, increased consumption from unprotected surface sources and reduced time for other essential survival tasks for those who collect water. There are often long queues at water access points because it takes time to fill containers and in order to reduce the time required for fetching water and to encourage the use of safe water sources, the Sphere Project recommends that no more than 15 minutes is spent waiting in queues at water access points.

The queuing time at water point in both sub-counties with Majority at 42.2% reporting queuing for between 30 minutes and one hour while in Laisamis 39.0% reported to be queuing for less than 30 minutes. This is as shown in the graph below:

[9] Freshwater Availability and Water Fetching Distance Affect Child Health in Sub-Saharan Africa by Amy J. Pickering†§* and Jennifer Davis‡§*

[10] Freshwater Availability and Water Fetching Distance Affect Child Health in Sub-Saharan Africa by Amy J. Pickering†§* and Jennifer Davis‡§*

Figure 15: Queuing time at water points



3.8.4 Water treatment and hand washing

It is no doubt that water quantity and quality is of vital importance for the ecosystem.[11] The lack of water is further aggravated by insufficient treatment of water, particularly with rapid population growth.

With regard to treatment of the water before consumption, the situation varied in both sub-counties. In North Horr Sub County 32.5% while in Laisamis Sub county only 13.2% of the respondent who treated water before consumption which very low and highly associated with high malnutrition rate and high prevalence of diarrhoeal disease due to poor water and sanitation hygiene.

Most residence in North Horr who reported treating water were using Chemicals which included aqua tabs, P&G tabs and in Laisamis most of them were boiling water. Also it's worth noting a portion of residence of around 14.8% were using traditional herbs in treating water.

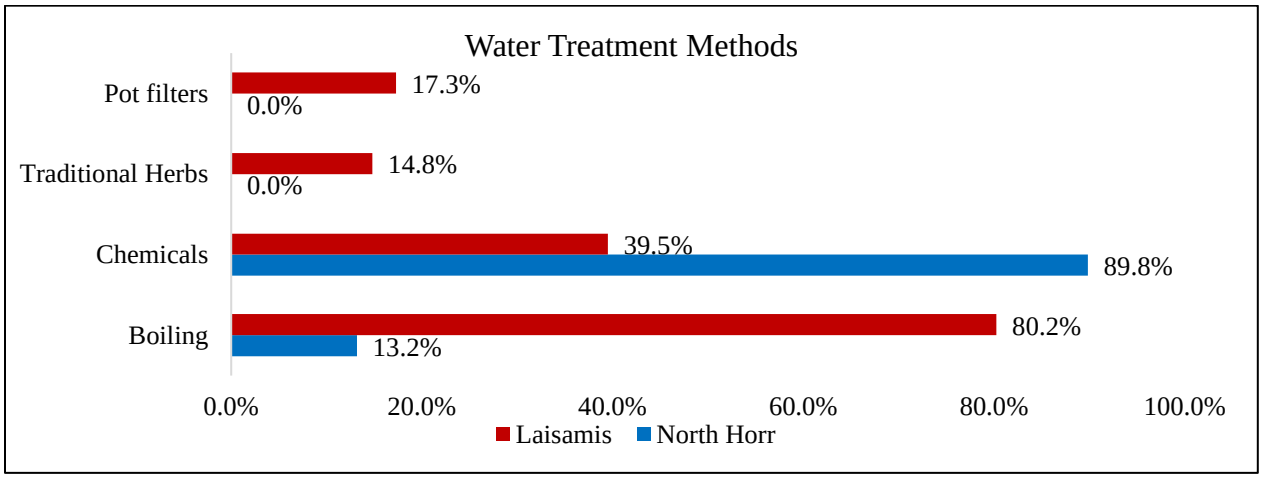


Figure 16: Water treatment Methods

[11] UNEP, Green Hills, Blue Cities: An Ecosystems Approach to Water Resources Management for African Cities. A Rapid Response Assessment, UNEP, Nairobi 2011.

Handwashing with soap is one of the most effective and inexpensive interventions for preventing diarrheal diseases and pneumonia, which together account for 3.5 million child deaths annually worldwide.[12] Handwashing is important for good health. Effective washing can be practiced with alternatives to soap and using a variety of different hygienic facilities. Overall, interventions to promote handwashing might save a million lives a year. Each person should be able to wash hands with water and soap after toilet use, before food preparation, before eating and after cleaning babies.

With regard to hand washing, over 60% in both sub counties were aware of handwashing practices but with handwashing at 4 critical times, the practice was poor in both sub-counties with 10.8% in North Horr and 13.2% in Laisamis reported to have washed their hands at the critical times. [13]This is as shown by the following table:

Figure 17: Water treatment and Handwashing

	North Horr		Laisamis	
Indicator	**n**	**%**	**n**	**%**
Household aware of Hand washing practices	361	59.6%	410	67.0%
After Toilet	238	65.9%	269	65.6%
Before cooking	236	65.4%	309	75.4%
Before Eating	309	85.6%	314	76.6%
After taking children to the toilet	70	19.4%	102	24.9%
Hand washing by Soap and water	264	73.1%	201	49.0%
hand washing 4 critical times	**39**	**10.8%**	**54**	**13.2%**

3.8.5 Payment and water storage

With regard to water payment, 27.6 %(167) and 57.8% (354) of the respondent pay for water in North Horr and Laisamis respectively. With over 60% paying on Monthly basis. Storing water is a good survival skill to learn as it is our planet's most precious resource and should never, ever be wasted. Also, it is important to have for drinking, making food and personal hygiene. With regard to water storage, over 80% of the residence surveyed reported to store water in closed container and Laisamis around 77% reported to store water in closed containers.

[12] Cairncross, S. and Valdmanis V. (2006) Chapter 41: Water Supply, Sanitation, and Hygiene Promotion. In D.T. Jamison, J.G. Breman, A.R. Measham, et al. (Editors), Disease Control Priorities in Developing Countries, 2nd edition (771-792). Washington (DC): World Bank.
[13] People wash their hands with soap at four critical times: after defecation, after changing diapers, before preparing food, and before eating

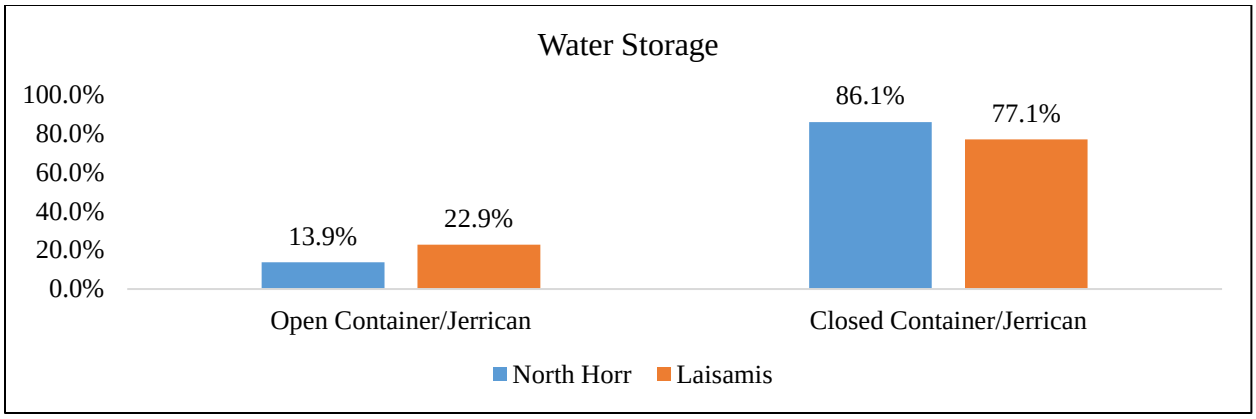


Figure 18: Water storage

3.8.6 Sanitation Facilities

People with at least basic sanitation services are considered to have safely managed sanitation services if the excreta from their homes is transported through sewers and treated off-site. Poor management of excreta is linked to transmission of diseases such as cholera, diarrhoea, dysentery, hepatitis A, typhoid and polio, and also contributes to malnutrition. Inadequate sanitation is estimated to cause 280 000 diarrhoeal deaths annually and is a major factor in several neglected tropical diseases, including intestinal worms, schistosomiasis, and trachoma.[14] Proper sanitation facilities (for example, toilets and latrines) promote health because they allow people to dispose of their waste appropriately. Sanitation Facilities are classified as:

- Improved sanitation which include:
  - Flush toilet
  - Connection to a piped sewer system
  - Connection to a septic system
  - Flush / pour-flush to a pit latrine
  - Pit latrine with slab
  - Ventilated improved pit latrine (abbreviated as VIP latrine)
  - Composting toilet
- Unimproved Sanitation which include:
  - Public or shared latrine (meaning a toilet that is used by more than one household)
  - Flush/pour flush to elsewhere (not into a pit, septic tank, or sewer)
  - Pit latrine without slab
  - Bucket latrines
  - Hanging toilet / latrine
  - No facilities / bush / field (open defecation)

In terms of accessing toilet facilities and ways of relieving, Over 70% of the respondent in both North Horr and Laisamis sub counties use unimproved sanitation facilities.

[14] Global Health Observatory (GHO) data: Use of improved sanitation facilities

The findings are summarized in the table below:

Table 10: Sanitation Facilities

	North Horr	Laisamis
Ventilated Improved Pit Latrine	14.4%	6.4%
Pit latrine with slab	5.8%	10.6%
Pit latrine without slab/open pit	1.3%	4.6%
Composting toilet	5.6%	0.0%
No facility /Bush/field	71.9%	73.7%
Other	0.5%	2.9%
Hanging toilet/Latrine	0.5%	1.8%
Improved Sanitation Facility	**25.8%**	**17.0%**
Unimproved Sanitation Facility	**74.2%**	**83.0%**

3.9 Food Security

3.9.1 Women dietary Diversity

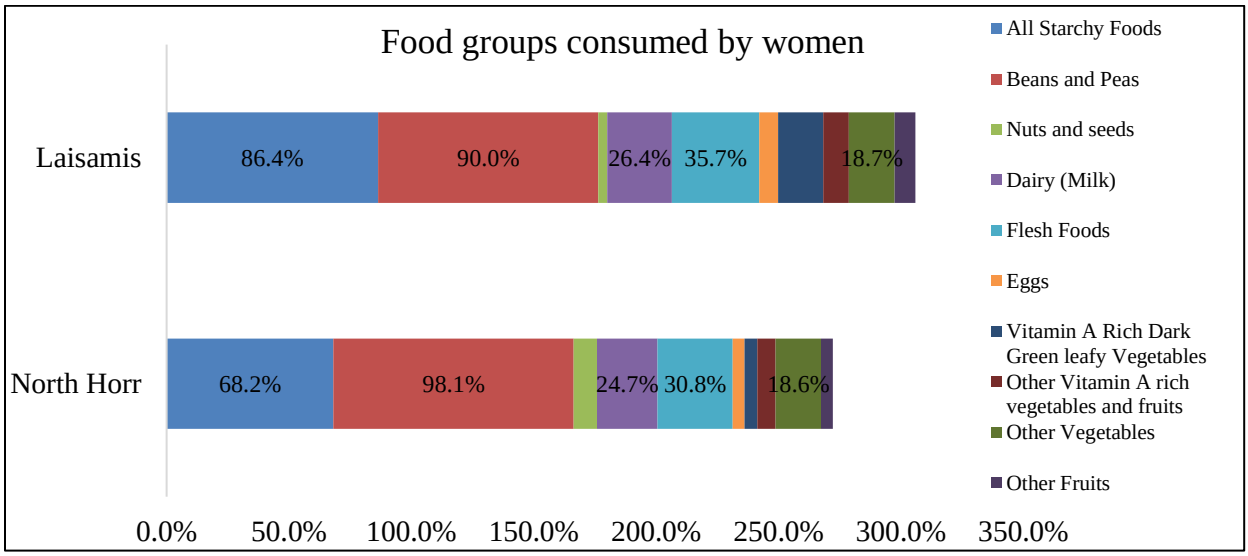
Women of reproductive age (WRA)[15] are often nutritionally vulnerable because of the physiological demands of pregnancy and lactation. Requirements for most nutrients are higher for pregnant and lactating women than for adult men[16]. Outside of pregnancy and lactation, other than for iron, requirements for WRA may be similar to or lower than those of adult men, but because women may be smaller and eat less (fewer calories), they require a more nutrient-dense diet [17] Insufficient nutrient intakes before and during pregnancy and lactation can affect both women and their infants. Yet in many resource poor environments, diet quality for WRA is very poor, and there are gaps between intakes and requirements for a range of micronutrients[18].

In assessing the nutritional quality and quantity of the food consumed by the surveyed women of reproductive age, a 24 hour recall period household dietary diversity questionnaire was administered and consumption of 10 food groups in the both Sub Counties is depicted in the graph below. In Laisamis, starch is the most consumed by women in North Horr and Laisamis sub Counties were legumes and

[15] For the purposes of this document and indicator, WRA are defined as those 15–49 years of age.
[16] National Research Council, 2006; World Health Organization [WHO]/Food and Agriculture Organization of the United Nations [FAO], 2004
[17] "Nutrient density" refers to the ratio of nutrients (such as vitamins and minerals) to the energy content of foods.
[18] Arimond et al., 2010; Lee et al. 2013

pulses, all starchy foods, flesh foods and dairy Product. The least fed on food were Nuts and seeds, eggs, other fruits and All Vitamin A vegetable and fruits. This is as shown in the graph below:

Figure 19: Food groups consumed by women



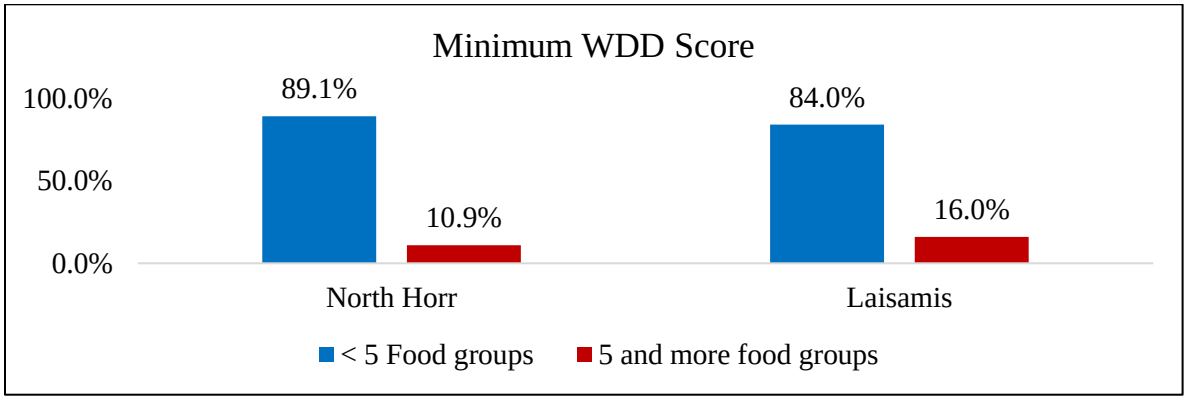
3.9.2 Minimum Dietary Diversity for Women

MDD-W[19] is a dichotomous indicator of whether or not women 15-49 years of age have consumed at least five out of ten defined food groups the previous day or night. The proportion of women 15–49 years of age who reach this minimum in a population can be used as a proxy indicator for higher micronutrient adequacy, one important dimension of diet quality. The indicator constitutes an important step towards filling the need for indicators for use in national and subnational assessments. It is a population-level indicator based on a recall period of a single day and night, so although data are collected from individual women, the indicator cannot be used to describe diet quality for an individual woman. This is because of normal day-to-day variability in individual intakes.

With regard to Minimum WDDS, Over 90% of the women surveyed had consumed more than 5 food groups in both North Horr and Laisamis Sub counties. This is as shown in the graph below:

[19] Additional background on the indicator is available at: http://www.fantaproject.org/monitoring-and-evaluation/ minimum-dietary-diversity-women-indicator-mddw.

Figure 20: Minimum Women Dietary Diversity Score

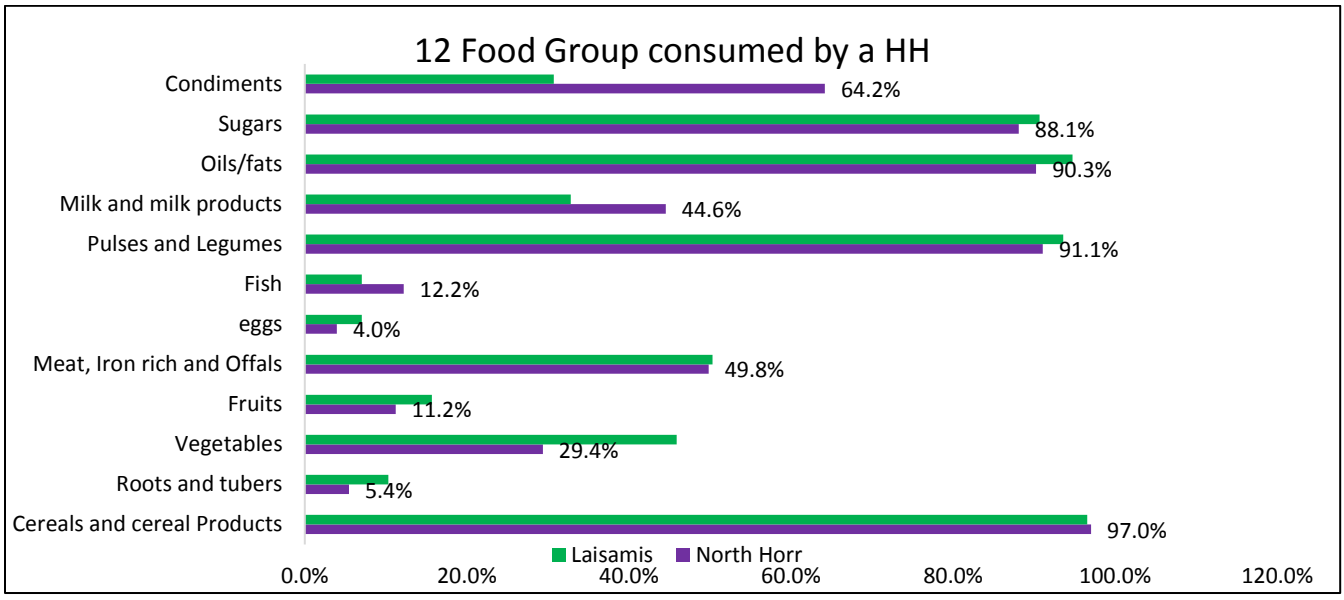


3.9.3 Household Dietary Diversity

In assessing the nutritional quality and quantity of the food consumed by the survey population, a 1 week retrospective household dietary diversity questionnaire was administered that would also help to determine the households' economic capacity to consume various foods in the sub-counties.

Four main food groups were consumed and were consistent in both sub-counties where the survey was conducted. This were cereals, legumes and pulses, fats and oils and sweets which were consumed by at least more than 80% of the population that was surveyed within the last 7 days. Fish, eggs, fruits and vegetables was consumed by at least less than 15% of the surveyed population and was consistent in both sub-counties. Milk and Milk Products, Iron rich foods and Vegetable were consumed by less than 50% of the surveyed population. This is as shown in the graph below:

Figure 21: 12 Food groups Consumed by the HH

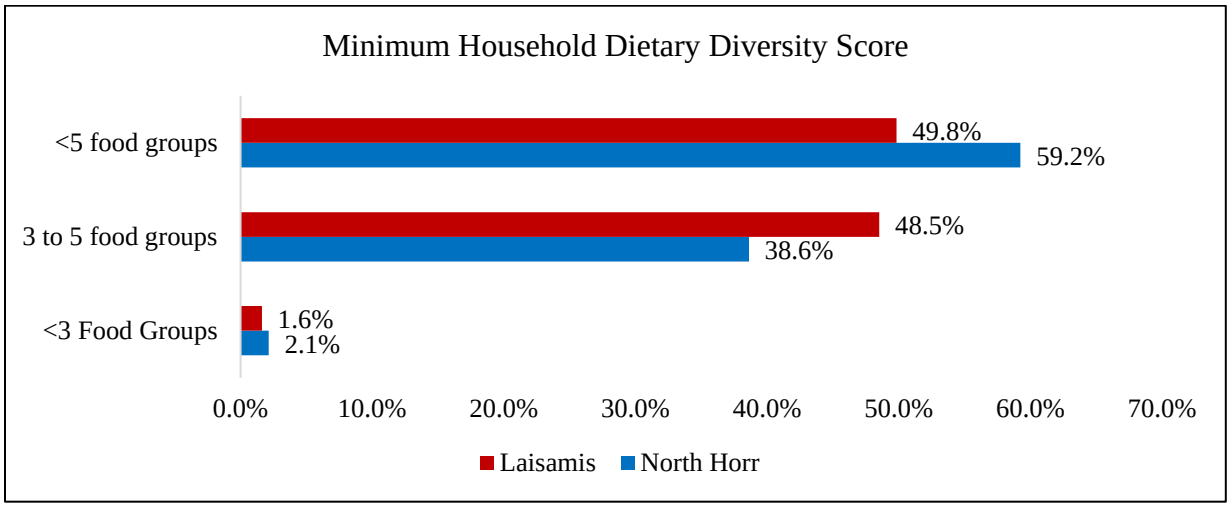


The proportion of households consuming cereals and cereal products and pulses and legumes was high and could be attributed to general food distribution and the blanket supplementary feeding program that was ongoing during the survey period.

3.9.4 Minimum Household Dietary Diversity

Household dietary diversity Score (HDDS) is a qualitative measure of food consumption that reflects household access to a variety of foods. Minimum Household Dietary Diversity is indicator of whether or not a household has consumed at least three out of twelve defined food groups within the last 7 days. At least more than 50% of the household surveyed had consumed more than 5 food groups in both Sub counties. 38.6% and 48.5% of the household surveyed had consumed 3 to 5 food groups in North Horr and Laisamis sub counties respectively.

Figure 22: Minimum Household Dietary Diversity

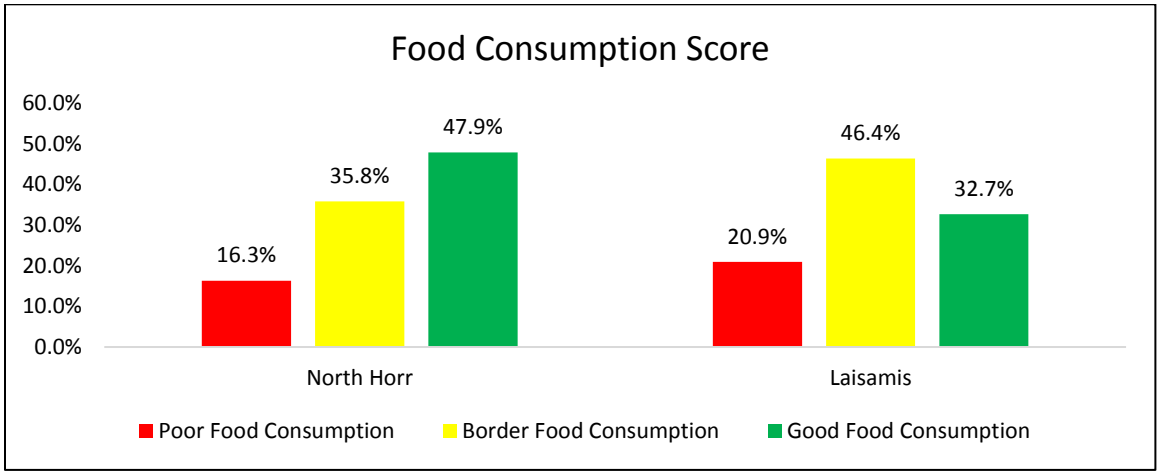


3.9.5 Household Food Consumption Score

The food consumption score is an acceptable proxy indicator to measure caloric intake and diet quality at household level, giving an indication of food security status of the household. It's a composite score based on dietary diversity, food frequency and relative nutritional importance of different food groups.

In Laisamis Sub County, 32.7% of the household surveyed had *acceptable* food consumption Score, 46.4% had *Borderline* and 20.9% had *poor* consumption score. In North Horr Sub County, 47.9% of the household surveyed had *acceptable,* 35.8% had *Borderline* and 16.3% had *poor* food consumption score. This is as shown in the figure below:

Figure 23: Household Food Consumption Score



3.9.6 Food Consumption Score –Nutrition

WFP's key corporate indicator for measuring food insecurity is the Food Consumption Score (FCS) used to define categories of household (HH) food insecurity. The information gathered to develop the FCS additionally provides a wealth of unexploited data that can be used to inform on nutrient rich groups consumed by the HH and which are essential for nutritional health and well-being: protein, iron and vitamin A.

All macronutrients (carbohydrates, proteins and lipids) and micronutrients (vitamins and minerals) are important to ensure a healthy life, and all nutrients should be represented in a sufficient quantity for a balanced diet.

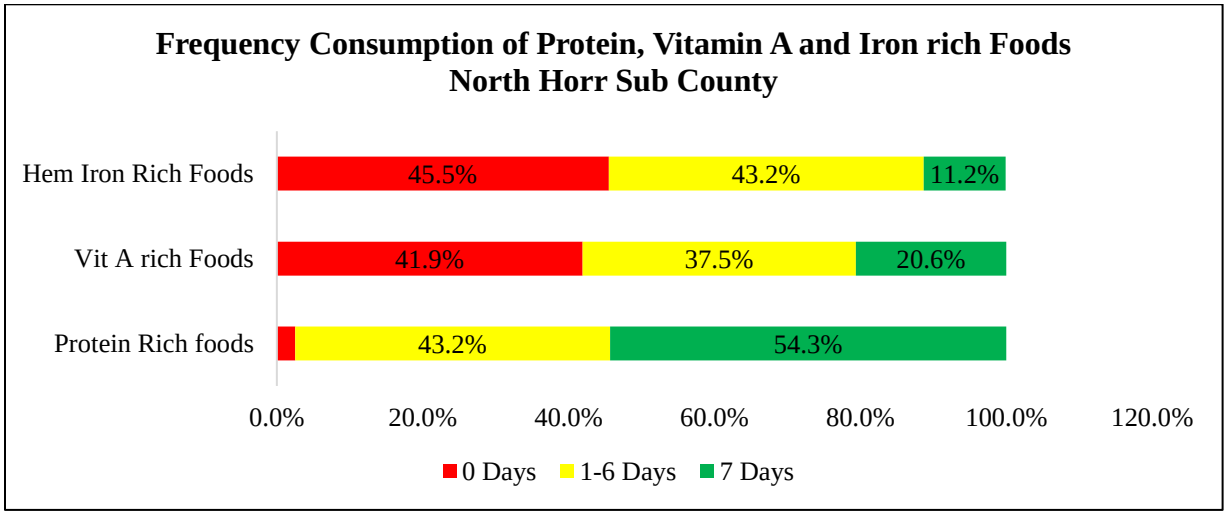
Macronutrients are good sources of energy. A lack in energy quickly leads to acute undernutrition. An insufficient intake of protein (essential for growth) is a risk for wasting and stunting. It also has an impact on micronutrient intake as protein foods are rich sources of vitamins and minerals.

Deficiencies in micronutrients, **such as vitamin A and iron,** over a long period of time, lead to chronic undernutrition. Iron deficiency leads to anaemia and Vitamin A deficiency leads to blindness and interferes with the normal functioning of the immune system, growth and development as well as reproduction.

This tool chooses to focus on three key nutrients; Protein, Vitamin A and Iron (hem iron) primarily for their nutritional importance but also those foods rich in these nutrients can be easily grouped from food consumption data.

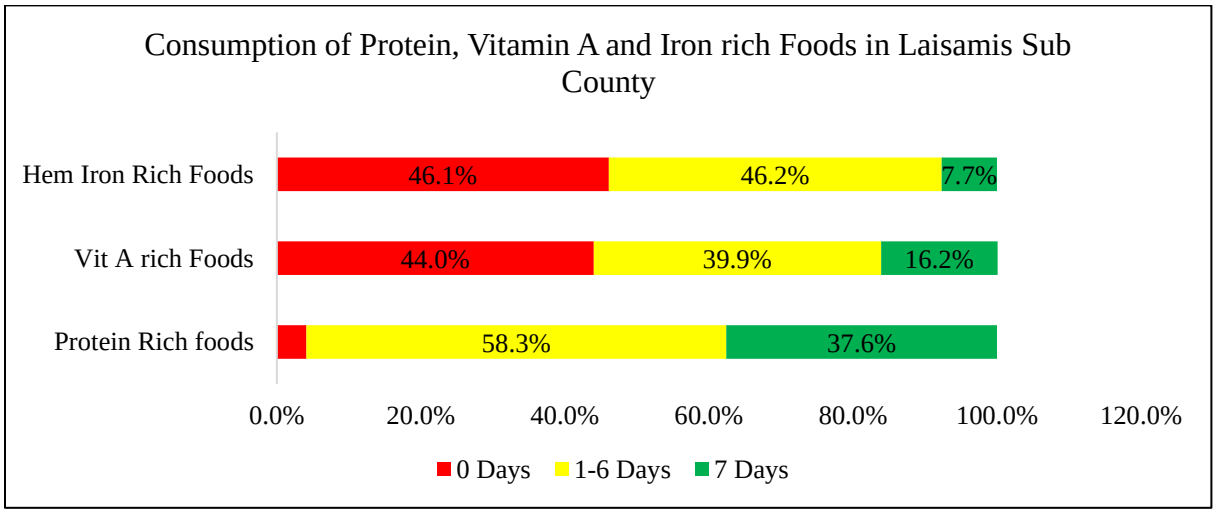
With Regard to Food consumption Score Nutrition, among the household surveyed in North Horr Sub Counties, 54.3% consumed protein Rich foods, 20.6% consumed Vitamin A rich foods and 11.2% consumed Hem Iron rich foods for 7 days. Over 40.0% of the household surveyed consumed Vitamin A and Hem Iron Foods for 0 days.

Figure 24: Frequency Consumption of Protein, Vitamin A and Iron rich foods in North Horr Sub County



With Regard to Food consumption Score Nutrition, among the household surveyed in Laisamis Sub Counties, 37.6% consumed protein Rich foods, 16.2% consumed Vitamin A rich foods, and 7.7% consumed Hem Iron rich foods for 7 days. Over 40.0% of the household surveyed consumed Vitamin A and Hem Iron rich foods for 0 days.

Figure 25: Frequency Consumption of Protein, Vitamin A and Iron rich Foods in Laisamis Sub County



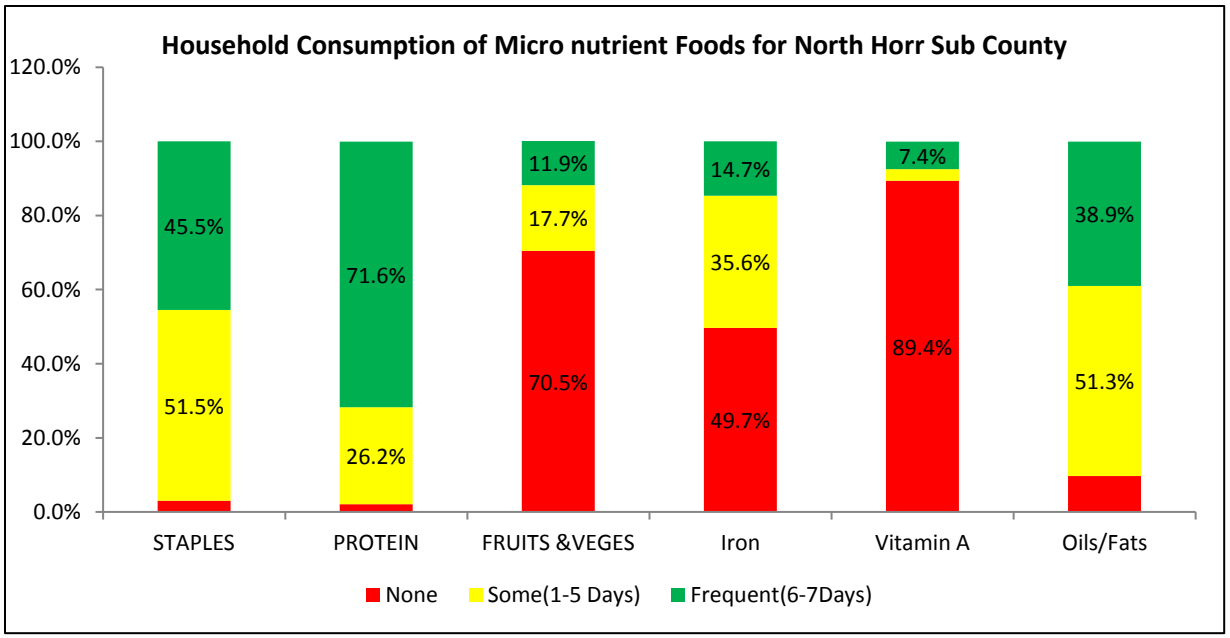
3.9.7 Micro Nutrient

The poor quality of the habitual diet and the lack of dietary diversity in much of the developing world contribute to deficiencies of micronutrients. Micronutrient malnutrition is a global problem much bigger than hunger and imposes enormous costs on societies in terms of ill health, lives lost, reduced economic productivity and poor quality of life. Addressing the global challenge of micronutrient malnutrition requires the need for many strategies – both short- and intermediate-term and long-term

sustainable approaches. In addition to the conventional approaches of micronutrient supplementation and fortification, promoting sustainable food based approaches to enable adequate intakes of micronutrients by much of the population includes dietary diversification strategies and agriculture-based approaches. Dietary diversification is possible by the promotion of homestead food production, which includes home gardening, small livestock rearing and fishing as well as the processing and preservation of food. Agriculture and agricultural biotechnology offer the opportunity of increasing crop yields and have the potential to improve the micronutrient content of staple foods and cereal crops, thus contributing to better nutrition of populations and thereby helping to achieve nutrition security. By ensuring food and nutrition security and by reducing the widespread problem of micronutrient malnutrition we may hope to achieve the targets set for the Millennium Development Goals.

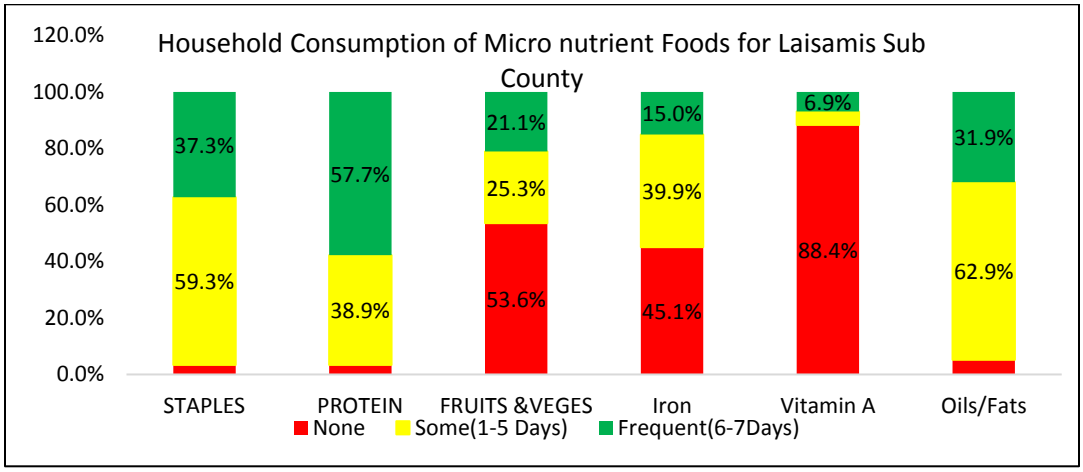
With Regard to Household Consumption of micronutrient rich Foods, among the household surveyed in North Horr Sub County, 11.9% had consumed Fruits and Vegetables, 14.7% had consumed Iron rich Foods and 7.4% had consumed Vitamin A rich foods, 71.6% had consumed protein rich foods and 45.5% had consumed staples for 7 days.

Figure 26: Household Consumption of Micro nutrients rich foods in North Horr Sub County



With Regard to Household Consumption of micronutrient rich Foods, among the household surveyed in Laisamis Sub County, 21.1% had consumed Fruits and Vegetables, 15.0% had consumed Iron rich Foods and 6.9% had consumed Vitamin A rich foods, 57.7 % had consumed protein rich foods and 37.3% had consumed staples for 7 days.

Figure 27: Household Consumption of Micro nutrient rich foods in Laisamis Sub County

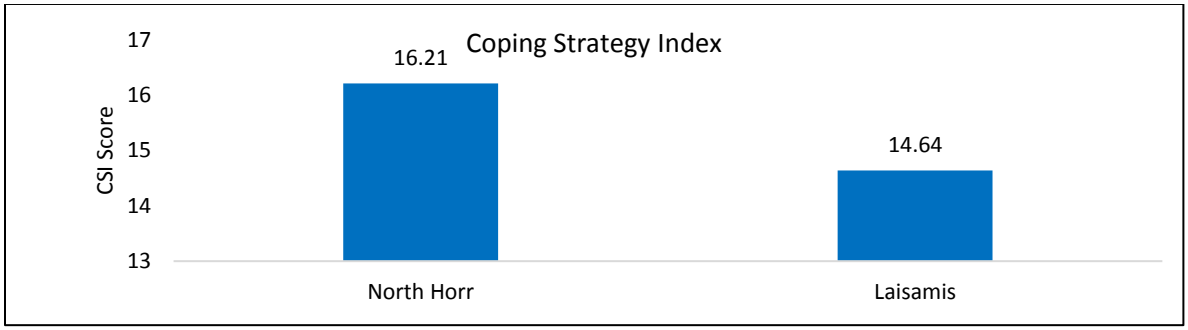


3.10 Coping strategy Index

The Coping Strategy Index (CSI), a tool developed by the World Food Programme, is commonly used as a proxy indicator for access to food.[20] It is a weighted score that allows one to measure the frequency and severity of coping strategies. Data is collected on the number of days in the last seven days a household used a specific coping strategy due to a shortage of food and/or income. In Laisamis 64.2% (393) and North Horr 58.7% (356) household applied coping strategy for the last 7 days.

The mean coping strategy Index for Laisamis Sub County was 14.64 and for North Horr Sub county was 16.21.

Figure 28: Mean Strategy Coping Index



3.11. Food Fortification

Fortification is adding vitamins and minerals to foods to prevent nutritional deficiencies. The nutrients regularly used in grain fortification prevent diseases, strengthen immune systems, and improve productivity and cognitive development. Wheat flour, maize flour, and rice are primarily fortified to:

20 'Access to food' is just one of the three pillars of food security. Other pillars include, 'food availability' and 'food utilization'.

- Prevent nutritional anemia
- Prevent birth defects of the brain and spine
- Increase productivity
- Improve economic progress

Food fortification was identified as the second strategy of four by the WHO and FAO to begin decreasing the incidence of nutrient deficiencies at the global level.[21] As outlined by the FAO, the most common fortified foods are cereals (and cereal based products), milk (and milk products), fats and oils, accessory food items, tea and other beverages, and infant formulas.[22] Undernutrition and nutrient deficiency is estimated globally to cause between 3 and 5 million deaths per year.

With regard to the survey, only 6.8% (41) and 16.0% (75) of the households in North Horr and Laisamis Sub counties had heard/learn about food fortification. Most of the households had heard through road shows followed by radio. Only 5.1 %(31) and 8.3 %(51) of the household surveyed reported that knew if the maize flour they consumed is fortified or not in North Horr and Laisamis respectively.

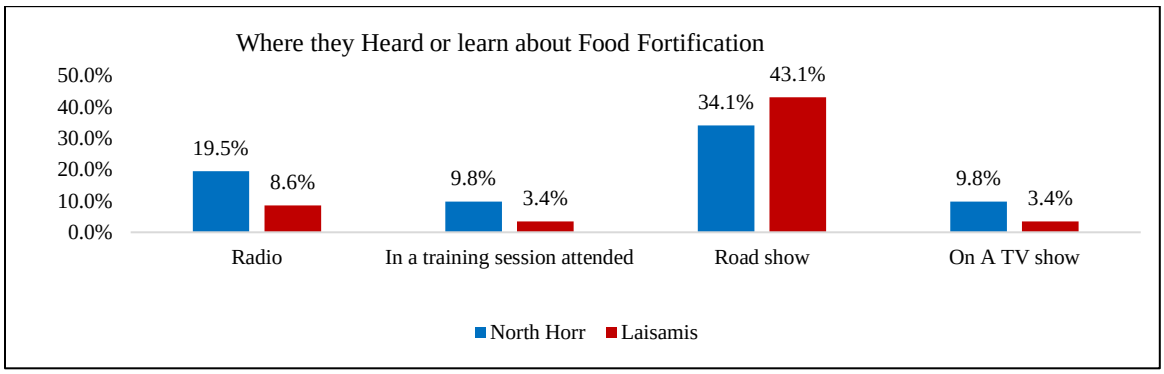


Figure 29: Where they heard or learn about food fortification

3.11.1 Micronutrient Powder

Multiple micronutrient powders are single-dose packets of vitamins and minerals in powder form that can be sprinkled onto any ready to eat semi-solid food consumed at home, school or any other point of use. The benefit of using MNPs are:

- Prevent micronutrient deficiencies specially anemia
- Improve the body's immune system
- Improve a child's appetite
- Improve a child's ability to learn and develop
- Makes a child clever, strong and active

With regard to the survey, only 12.3% (19) and 10.4% (20) of the children aged 6 to 23 months were enrolled for MNPs program in North Horr and Laisamis Sub Counties respectively.

21 World Health Organization and Food and Agriculture Organization of the United Nations Guidelines on food fortification with micronutrients. Archived 26 December 2016 at the Wayback Machine. 2006 [cited on 2011 Oct 30].
22 Micronutrient Fortification of Food: Technology and Quality Control Archived 2 September 2016 at the Wayback Machine

Chapter 4

CONCLUSION AND RECOMMENDATIONS

FINDINGS	RECOMMENDATION	ACTOR (BY WHOM?)	TIME LINE
Critical GAM rates in Laisamis and North Horr of 21.2% and 21.8% respectively.	➢ Review the county drought response plan, outline any gap and resource mobilize for scale up where needed.	CHMT, SCHMT and Implementing Partners	Immediately
	➢ Review sub county level mapping & prioritization of integrated outreaches in the hot spots and highly populated locations that don't have health facilities.	SCHMT and Implementing Partners	Immediately and quarterly
	➢ Prioritize screening for malnutrition and enrolment for treatment in all hot spots from Jan 2018 SMART survey.	SCHMT and Implementing Partners.	19th February to 17th March 2018
	➢ Share all referrals to CHVs during the review meetings for follow up and to form part of discussion in the meetings	SCHMT and Implementing Partners	Immediately
	➢ Compose a taskforce at SCHMT with CHA in the team to monitor admissions referred at facility level	SCHMT and Implementing Partners	February 2018
	➢ Conduct IMAM coverage assessment in all the sub counties to confirm coverage and better inform programming	SCHMT and Implementing Partners	After every 2 years
	➢ Integrate the last cycle BSFP distributions with screening and treatment/supplementation (VAS and deworming) on site in both Laisamis and North Horr sub counties.	SCHMT and Implementing Partners	Continuous
	➢ Promote the consumption of the least consumed food groups such as eggs, fish, fruits, and vegetables through SBCC approaches/Plans developed by the sub counties	SCHMT and Implementing Partners	Continuous
	➢ Establish a surge team composed of different health cadres at county level that could timely respond to outbreak i.e. Malaria outbreak in North Horr	SCHMT and Implementing Partners	Continuous

High Malnutrition level for PLW at 12.1% and 30.9% for North Horr and Laisamis respectively.	➢ Causal analysis for Laisamis sub county to better establish the immediate and underlying causes for high Malnutrition for PLW to inform programing and roll out of SBCC.	CHMT, SCHMT and Implementing Partners.	Immediately .
	➢ Incorporate counselling and education on ideal diets, food choices and preparation demos alongside CTP and Protection Ration support programs.	CHMT, SCHMT and Implementing Partners	Underway and continuous
	➢ Carry out a post monitoring exercise after protection ration and cash transfer project.	CHMT, SCHMT and Implementing Partners	After every distribution
Poor water, hygiene and sanitation in both Laisamis and North Horr.	➢ Raising awareness around WASH through community based forums and schools. Through utilization of CHAs and CHVs during their routine HH visits and in community dialogue meetings	CHMT, SCHMT and Implementing Partners	Underway and continuous
	➢ Provision of NFIs (water treatment chemicals, soaps and purifiers) Health facilities and Community so as to access water.	CHMT, SCHMT and Implementing Partners	Underway and continuous
	➢ Specifically focus on scaling up WASH services/interventions in Laisamis	CHMT, SCHMT and Implementing Partners	Underway and continuous
Inadequate monitoring of IMAM surge at facility and sub county level (Laisamis & Saku).	➢ Real time monitoring of IMAM surge Approach and Continuous updating of the dashboards to show how is the situation without waiting for a population Survey need to be enhanced in Laisamis and Saku	CHMT, SCHMT and Implementing Partners	Ongoing for North Horr and Moyale. Enhance support for
	➢ Establishment of surge dashboard at County level	CHMT, SCHMT and Implementing Partners	April 2018
	➢ Sensitization of the CHMT and untrained SCHMT on IMAM surge to enhance sub county level surge monitoring and support.	CHMT, SCHMT and Implementing Partners	From March 2018
	➢ Deploy nutritionist to support health facilities located in the hotspot areas to enhance capacity to provide quality nutrition services.	CHMT, SCHMT and Implementing Partners	Every Quarter

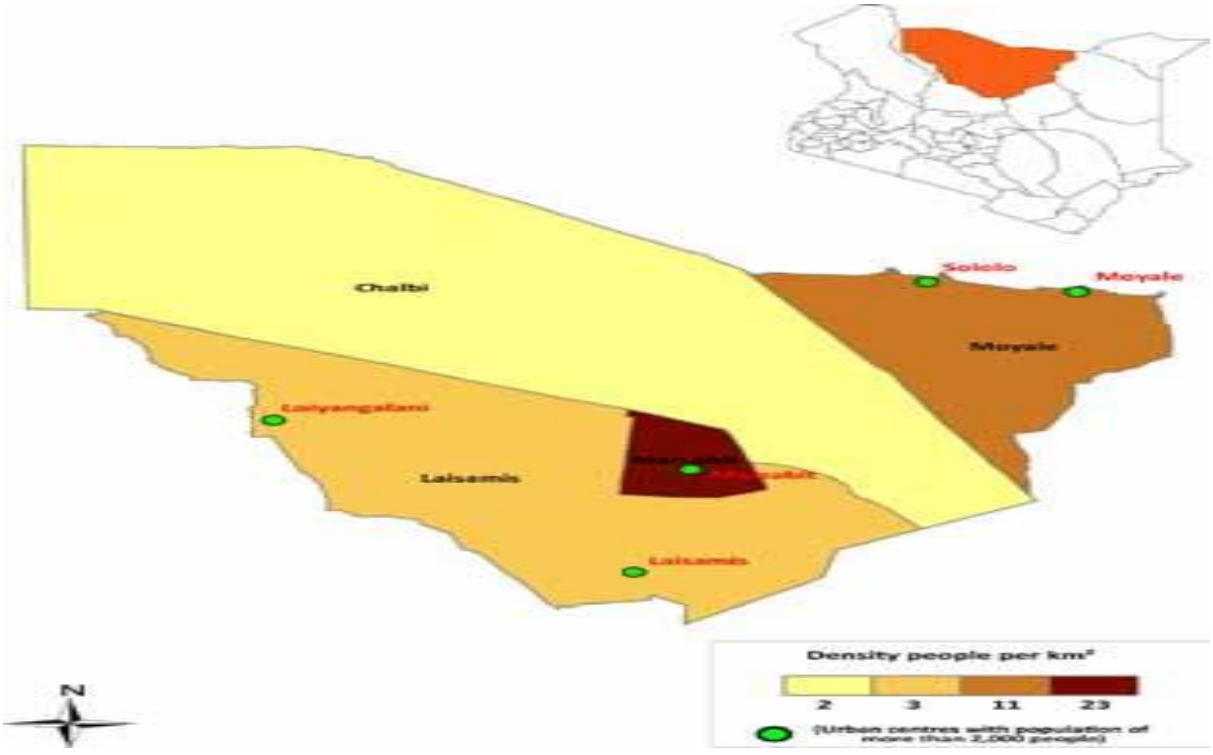
	➢ Support quarterly mass screening for malnutrition by Weight for Height through trained CHVs and health workers to enhance case finding.	CHMT, SCHMT and Implementing Partners	Every Quarter
Low coverage for Vitamin A supplementation and Deworming for children < 5 years.	➢ Routine follow up and monitoring for coverage during health facilities data review meeting.	CHMT, SCHMT and Implementing Partners.	Underway and continuous
Poor documentation of Vitamin A supplementation and deworming on the Mother child booklets.	➢ Support requisition and distribution of Vitamin A and De-wormers on semester basis (based on targets) to prevent stock outs.	CHMT, SCHMT and Implementing Partners	Underway and continuous
	➢ Ensure availability of Mother Child booklets and promote utilization of the same for service documentation	CHMT, SCHMT and Implementing Partners	Underway and continuous
	➢ Procurement and distribution of MNP for children 6- 24months	CHMT, SCHMT and Implementing Partners	Underway and continuous
	➢ Carry out DQAs bi-annually to identified poorly performing nutrition indicators	CHMT, SCHMT and Implementing Partners	Underway and continuous
	➢ Improve Vitamin A coverage (more especially for twice yearly supplementation)	CHMT, SCHMT and Implementing Partners	Underway and continuous
	➢ Improve the coverage for Number of the children Dewormed(12-59M)	CHMT, SCHMT and Implementing Partners	Underway and continuous
	➢ Improve coverage to increase the number of the children receiving treatment.	CHMT, SCHMT and Implementing	Underway and
	➢ Improved investment in WASH i.e. • CLTS • Supportive policies and market environment	CHMT, SCHMT and Implementing Partners	Underway and continuous
	➢ Improve maternal infant and young child (MIYCN) practices through implementation of BFCI activities at the community level.	CHMT, SCHMT and Implementing Partners	Underway and continuous

ANNEXES

Annex 1: Overall Score of the Survey

Indicator	Acceptable values/range	North Horr	Laisamis
Flagged data (% of out of range subjects)	<7.5	**0** (0.9 %)	**0** (2.3%)
Overall sex ratio (significant CHI square)	>0.001	**0** (p=0.670)	**0** (p=0.151)
Age ratio (6-29vs 30-59) Significant CHI	>0.001	**0** (p=0.539)	**0** (p=0.118)
Dig. prevalence score-weight	<20	**0** (4)	**0** (5)
Dig. prevalence score-height	<20	**0** (6)	**0** (5)
Dig. prevalence score-MUAC	<20	**0** (7)	**0** (5)
Standard Dev. Height WHZ	>0.80	**0** (0.98)	**0** (1.00)
Skewness WHZ	<±0.6	**1**(-0.26)	**0** (0.19)
Kurtosis WHZ	<±0.6	**0** (0.00)	**0** (-0.06)
Poisson WHZ -2	>0.001	**0** (p=0.313)	**0** (p=0.084)
OVERALL	**<25**	**1% (Excellent)**	**0% (Excellent)**

Annex 2: MAP of Marsabit County



Annex 3: Summary Findings

	North Horr January 2018	Laisamis January 2018
Global Acute Malnutrition (GAM)	21.8% (18.0-26.1)	21.2% (17.3-25.7)
Severe Acute Malnutrition (SAM)	5.2% (3.4- 7.9)	3.3% (2.1- 5.1)
Global underweight	26.5% (22.1-31.3)	34.4% (28.7-40.7)
Severe Underweight	5.4% (3.6- 8.1)	8.5% (5.9-12.1)
Global Stunting	19.9% (16.0-24.3)	29.8% (24.6-35.5)
Severe Stunting	4.4% (2.6- 7.4)	8.9% (6.1-12.9)
Global Malnutrition by MUAC < 125mm	3.4% (1.9- 5.8)	6.8% (4.5-10.3)
Severe under nutrition <115mm	0.2% (0.0- 1.7)	0.6% (0.2- 1.7)

		North Horr			Laisamis		
Average Household size	Average Household size	4.6			5		
% of U5	% of U5	17.60%			19.70%		
		n	**N**	**%**	**n**	**N**	**%**
school Enrolled 3-18 Years	Yes	714	1197	59.6%	700	1179	59.4%
Reason for not being in school	Chronic Sickness	2	483	0.4%	8	479	1.7%
	Weather	1	483	0.2%	1	479	0.2%
	Family labor Responsibilities i.e. Herding	235	483	48.7%	264	479	55.1%
	Working outside home	6	483	1.2%	1	479	0.2%
	Too poor to buy school items	13	483	2.7%	7	479	1.5%

	Household doesn't see value of schooling	32	483	6.6%	24	479	5.0%
	No food in the school	1	483	0.2%	1	479	0.2%
	Migrated /moved from school area	28	483	5.8%	3	479	0.6%
	Insecurity	3	483	0.6%	2	479	0.4%
	No school near by	54	483	11.2%	53	479	11.1%
	Married	17	483	3.5%	4	479	0.8%
	Young	81	483	16.8%	103	479	21.5%
	Not feeling well	5	483	1.0%	0	479	0.0%
	Disabled	1	483	0.2%	3	479	0.6%
	Child refused	0	483	0.0%	3	479	0.6%
	Teacher Absenteeism	0	483	0.0%	2	479	0.4%
	Drop out	3	483	0.6%	0	479	0.0%
	Father Refused	1	483	0.2%	0	479	0.0%
Education Level of Household Head	Pre primary	14	951	1.5%	7	1274	0.5%
	Primary	72	951	7.6%	74	1274	5.8%
	Secondary	60	951	6.3%	67	1274	5.3%
	Tertiary	36	951	3.8%	26	1274	2.0%
	None	769	951	80.9%	1100	1274	86.3%
Own a mosquito Net	Yes	369	606	60.9%	198	612	32.4%
Who slept	Under five	191	369	51.8%	101	198	51.0%
	PLW	98	369	26.6%	58	198	29.3%
	None	113	369	30.6%	28	198	14.1%
	Other Members	169	369	45.8%	68	198	34.3%
Main Occupation	Livestock Herding	482	606	79.5%	463	612	75.7%

	Own Farm labor	4	606	0.7%	2	612	0.3%
	Employed	14	606	2.3%	29	612	4.7%
	Casual labor	40	606	6.6%	44	612	7.2%
	Petty trade	19	606	3.1%	38	612	6.2%
	Merchant/Trader	2	606	0.3%	8	612	1.3%
	Firewood/Charcoal	14	606	2.3%	3	612	0.5%
	Fishing	9	606	1.5%	13	612	2.1%
	Others	22	606	3.6%	12	612	2.0%
Source of income	No income	15	606	2.5%	13	612	2.1%
	Sale of livestock	441	606	72.8%	429	612	70.1%
	Sale of livestock products	7	606	1.2%	33	612	5.4%
	Sale of crops	1	606	0.2%	0	612	0.0%
	Petty trading	65	606	10.7%	48	612	7.8%
	Casual labor	36	606	5.9%	49	612	8.0%
	Permanent Job	13	606	2.1%	23	612	3.8%
	Sale of Personnel assets	6	606	1.0%	3	612	0.5%
	Remittance	14	606	2.3%	7	612	1.1%
	Income earned by children	2	606	0.3%	2	612	0.3%
	Cash Transfers/Vouchers	5	606	0.8%	4	612	0.7%
	Others	1	606	0.2%	1	612	0.2%
Marital status	Married	479	606	79.0%	524	612	85.6%
	Single	8	606	1.3%	18	612	2.9%
	Widow	106	606	17.5%	58	612	9.5%
	Divorced	8	606	1.3%	6	612	1.0%
	Separated	5	606	0.8%	6	612	1.0%

Residence status	IDP	3	606	0.5%	0	612	0.0%
	Refugee	0	606	0.0%	2	612	0.3%
	Resident	603	606	99.5%	610	612	99.7%
Children have come to live with you recently	Yes	45	606	7.4%	44	612	7.2%
	No	561	606	92.6%	568	612	92.8%
Reason for coming to live with you?	Did not have access to Food	3	45	6.7%	7	44	15.9%
	Father and mother left Home	9	45	20.0%	15	44	34.1%
	Caregiver died	5	45	11.1%	7	44	15.9%
	School	8	45	17.8%	8	44	18.2%
	Others i.e. Adopted	20	45	44.4%	7	44	15.9%
Water source	Piped into dwelling	0	606	0.0%	32	612	5.2%
	Piped to yard/plot	0	606	0.0%	11	612	1.8%
	Piped to Neighbor	0	606	0.0%	26	612	4.2%
	Public tap/standpipe	10	606	1.7%	67	612	10.9%
	Tube well/Borehole	93	606	15.3%	246	612	40.2%
	Protected well	33	606	5.4%	16	612	2.6%
	Unprotected well	244	606	40.3%	120	612	19.6%
	Unprotected spring	3	606	0.5%	0	612	0.0%
	Rain water	14	606	2.3%	15	612	2.5%
	Tanker truck	14	606	2.3%	1	612	0.2%
	Cart with small tank	0	606	0.0%	1	612	0.2%
	Water Kiosk	75	606	12.4%	8	612	1.3%
	Surface water	104	606	17.2%	62	612	10.1%
	Others i.e. Underground tanks	16	606	2.6%	8	612	1.3%

Trekking distance	Less than 500m (<15min)	218	606	36.0%	268	612	43.8%
	>500m to <2km(15 to 1 hour)	266	606	43.9%	184	612	30.1%
	More than 2 km	122	606	20.1%	160	612	26.1%
Queue for Water	Yes	154	606	25.4%	328	612	53.6%
Queueing time	Less than 30 minutes	48	154	31.2%	128	328	39.0%
	30-1 hour	65	154	42.2%	89	328	27.1%
	More than 1 hour	41	154	26.6%	111	328	33.8%
Water treatment	Water Treatment	197	606	32.5%	81	612	13.2%
	Boiling	26	197	13.2%	65	81	80.2%
	Chemicals	177	197	89.8%	32	81	39.5%
	Traditional Herbs	0	197	0.0%	12	81	14.8%
	Pot filters	0	197	0.0%	14	81	17.3%
Water Storage	Open Container/Jerri can	84	606	13.9%	140	612	22.9%
	Closed Container/Jerri can	522	606	86.1%	472	612	77.1%
Pay for Water	Yes	167	606	27.6%	354	612	57.8%
Mode of Payment	Per 20L Jerri can	66	167	39.5%	125	354	35.3%
	Per month	101	167	60.5%	229	354	64.7%
Household Which wash Hands	Yes	361	606	59.6%	410	612	67.0%
Handing Washing	After Toilet	238	361	65.9%	269	410	65.6%
	Before cooking	236	361	65.4%	309	410	75.4%
	Before Eating	309	361	85.6%	314	410	76.6%
	After taking children to the toilet	70	361	19.4%	102	410	24.9%
Proper hand washing	Soap and water	264	361	73.1%	201	410	49.0%

4 critical hand washing moment	All critical moments	39	361	10.8%	54	410	13.2%
	Ventilated Improved Pit Latrine	87	606	14.4%	39	612	6.4%
	Pit latrine with slab	35	606	5.8%	65	612	10.6%
	Pit latrine without slab/open pit	8	606	1.3%	28	612	4.6%
	Composting toilet	34	606	5.6%	0	612	0.0%
	No facility /Bush/field	436	606	71.9%	451	612	73.7%
	Other	3	606	0.5%	18	612	2.9%
	Hanging toilet/Latrine	3	606	0.5%	11	612	1.8%
Food Consumption Score	Poor Food Consumption	99	606	16.3%	128	612	20.9%
	Border Food Consumption	217	606	35.8%	284	612	46.4%
	Good Food Consumption	290	606	47.9%	200	612	32.7%
Household Dietary Diversity	Cereals and cereal Products	588	606	97.0%	591	612	96.6%
	Roots and tubers	33	606	5.4%	63	612	10.3%
	Vegetables	178	606	29.4%	281	612	45.9%
	Fruits	68	606	11.2%	96	612	15.7%
	Meat, Iron rich and Offal's	302	606	49.8%	308	612	50.3%
	eggs	24	606	4.0%	43	612	7.0%
	Fish	74	606	12.2%	43	612	7.0%
	Pulses and Legumes	552	606	91.1%	573	612	93.6%
	Milk and milk products	270	606	44.6%	201	612	32.8%
	Oils/fats	547	606	90.3%	580	612	94.8%
	Sugars	534	606	88.1%	555	612	90.7%
	Condiments	389	606	64.2%	188	612	30.7%

Women Dietary Diversity	All Starchy Foods	257	377	68.2%	406	470	86.4%
	Beans and Peas	370	377	98.1%	423	470	90.0%
	Nuts and seeds	36	377	9.5%	17	470	3.6%
	Dairy (Milk)	93	377	24.7%	124	470	26.4%
	Flesh Foods	116	377	30.8%	168	470	35.7%
	Eggs	18	377	4.8%	36	470	7.7%
	Vitamin A Rich Dark Green leafy Vegetables	20	377	5.3%	87	470	18.5%
	Other Vitamin A rich vegetables and fruits	28	377	7.4%	49	470	10.4%
	Other Vegetables	70	377	18.6%	88	470	18.7%
	Other Fruits	18	377	4.8%	40	470	8.5%
Minimum Women Dietary Diversity	< 5 Food groups	336	377	89.1%	395	470	84.0%
	5 and more food groups	41	377	10.9%	75	470	16.0%
Minimum Household Dietary Diversity	<3	13	606	2.1%	10	612	1.6%
	3 to 5 food groups	234	606	38.6%	297	612	48.5%
	<5 food groups	359	606	59.2%	305	612	49.8%
Food Fortification	Heard about Food Fortification	41	606	6.8%	58	612	9.5%
	Radio	8	41	19.5%	5	58	8.6%
	In a training session attended	4	41	9.8%	2	58	3.4%
	Road show	14	41	34.1%	25	58	43.1%
	On A TV show	4	41	9.8%	2	58	3.4%
	Know about the Food fortification Sign	18	41	43.9%	31	58	53.4%
Main Source of Maize Flour	Bought from a nearby Posho mill	83	606	13.7%	63	612	10.3%

	Bought from the shops and supermarket	493	606	81.4%	546	612	89.2%
	Maize is taken for milling at a nearby posho mill	30	606	5.0%	1	612	0.2%
Maize Flour consumed fortified	Yes	31	606	5.1%	51	612	8.3%
Morbidity	Yes	103	453	22.7%	217	548	39.6%
Morbidity Prevalence	Prevalence of Fever	81	453	17.9%	68	548	12.4%
	Prevalence of ARI	51	453	11.3%	152	548	27.7%
	Prevalence of Watery Diarrhoea	12	453	2.6%	29	548	5.3%
	Prevalence of Bloody Diarrhoea	2	453	0.4%	1	548	0.2%
	Prevalence of Others	4	453	0.9%	2	548	0.4%
Zinc supplementation	Zinc Supplementation	5	12	41.7%	22	29	75.9%
Health Seeking Behavior	Yes	50	103	48.5%	167	217	77.0%
Where sought for health Assistance	Traditional Healer	0	50	0.0%	1	167	0.6%
	Community Health worker	18	50	36.0%	3	167	1.8%
	Mobile Clinic	7	50	14.0%	3	167	1.8%
	Relative/Friend	0	50	0.0%	0	167	0.0%
	Private Clinic/Pharmacy	1	50	2.0%	14	167	8.4%
	Shops/kiosk	1	50	2.0%	1	167	0.6%
	Local herbs	0	50	0.0%	0	167	0.0%
	NGO/FBO	0	50	0.0%	1	167	0.6%
	Public Clinic	34	50	68.0%	149	167	89.2%
	Others	0	50	0.0%	1	167	0.6%

Vitamin A supplementation	Vitamin A Supplementation (12-59 Months) - Once	298	407	73.2%	416	487	85.4%
	Vitamin A Supplementation (6-11 Months)- Once	28	46	60.9%	32	61	52.5%
	Vitamin A Verified by Card (6-11 Months)	26	46	56.5%	30	61	49.2%
	Vitamin A Supplementation (12-59 Months) - Twice	177	407	43.5%	234	487	48.0%
	Vitamin A Verified by Card (12-59 Months)	296	407	72.7%	395	487	81.1%
Deworming	Deworming (12-59 Months)	239	407	58.7%	293	487	60.2%
Measles Coverage	Measles at 9 Months (Yes by Card)	264	437	60.4%	386	518	74.5%
	Measles at 9 Months (Yes by Recall)	125	437	28.6%	80	518	15.4%
	Measles at 18 Months (Yes by Card)	177	358	49.4%	225	397	56.7%
	Measles at 18 Months (Yes by Recall)	91	358	25.4%	81	397	20.4%
BCG	BCG by Scar	415	453	91.6%	517	548	94.3%
OPV Coverage	OPV 1 (Yes by Card)	290	453	64.0%	430	548	78.5%
	OPV 1 (Yes by Recall)	133	453	29.4%	84	548	15.3%
	OPV 3 (Yes by Card)	292	453	64.5%	423	548	77.2%
	OPV 3 (Yes by Recall)	125	453	27.6%	82	548	15.0%
Maternal Malnutrition Level	Malnourished (<210 mm)	56	435	12.9%	76	371	20.5%
	At Risk (210 - <230 mm)	145	435	33.3%	96	371	25.9%
	Malnourished (<210 mm)	37	307	12.1%	76	246	30.9%

Physiological Status of the WRA	Pregnant	61	435	14.0%	46	371	12.4%
	Lactating	244	435	56.1%	199	371	53.6%
	Pregnant and Lactating	2	435	0.5%	1	371	0.3%
	None of the above	128	435	29.4%	125	371	33.7%
Received IFAS	Yes	176	216	81.5%	204	256	79.7%
Days Consumed IFAS	Below 90 Days	168	176	95.5%	164	204	80.4%
	90 to >= 180	8	176	4.5%	39	204	19.1%
	Above 180 Days	0	176	0.0%	1	204	0.5%
MNP enrolled	Enrolled in MNP	19	154	12.3%	20	193	10.4%
Consumption of MNP	Consumed in the last 7 Days	13	19	68.4%	10	20	50.0%
Frequency of taking MNPs	Every Day	2	13	15.4%	4	10	40.0%
	Every Other Day	0	13	0.0%	2	10	20.0%
	Every Third Day	4	13	30.8%	2	10	20.0%
	2 days per week at any day	6	13	46.2%	2	10	20.0%
	At any day when I remember	1	13	7.7%	0	10	0.0%
Stop taking MNPs	1 week to 2 weeks	0	6	0.0%	2	10	20.0%
	2 weeks to 1 month	1	6	16.7%	0	10	0.0%
	More than 1 month	5	6	83.3%	8	10	80.0%
Reason for stopping taking MNPs	Finished all of the sachet	0	6	0.0%	9	10	90.0%
	Child did not like it	2	6	33.3%	1	10	10.0%
	Husband did not agree to give to the child	1	6	16.7%	0	10	0.0%
	Forgot	3	6	50.0%	1	10	10.0%
	Do not know about MNPs	122	135	90.4%	114	173	65.9%

Reason for not being Enrolled	Discouraged from what 1 heard from others	2	135	1.5%	0	173	0.0%
	The child has not fallen ill so have not gone to the health facility	5	135	3.7%	7	173	4.0%
	Health facility or outreach is far	10	135	7.4%	9	173	5.2%
	Child receiving therapeutic or supplementary foods	2	135	1.5%	20	173	11.6%
	Others	0	135	0.0%	23	173	13.3%

Annex 4: Clusters visited:

Village North Horr	Cluster	Village Laisamis	Cluster
Diba Okotu	1	town	1
Gamura	2	kula mawe	2
Chira	3	nakwamekwi	3
Duke 1/Duke 2	4	Laiyeni	4
Old Yaalgana/gotcha	5	Gatab chini	5
Elgade centre	6	Lgoon	6
Shankera	7	Gatab Kiwanja	7
Balesa/Ali Boru	8	Banachap	8
Qurqur	9	Mirgichan	9
Kiwanga ndege	10	Esimfecha	10
Liso	11	nebei	11
Lag wachu	12	kimogol	12
Segel	13	harebore	13
Ruchi Kushi	14	Naiyoki	14
Tuye kale/galgallo sharama	15	Tuungu	15
Shurr	16	town centre	16
Baulo	19	Manyatta secondary	17
Nangolei	20	Manyatta nairibi	18
Ilgele	21	Ulauli	19
Sieslucho	22	Ndikir	20
Telegaye	23	Merille Center 2	21
Malabot	24	Manyatta Ngamia	22
Gorich	25	Silapani	23
Gallas	26	mero town	24
Barambate	27	Trinity village	25

El-besso	28	uyaam	26
Isacko malla	31	goob thomas	27
Fila	32	dubsahay galimogle	28
Sesa raha	33	rongumo naale	29
Abdub tullu	34	saale kimogol	30
Dadacha kundi	35	tubcha galale	31
Garwole	36	goobore indee	32
Elyibo	37	uroween kahle	33
South C	40	nebey eysimbasete	34
Barambate	41	ongeli	35
Tumticha	42	ntil	36
Illeret town	17,18	Lmongoi	37
Qorqa	29,30	lukumai	38
Bales saru	38,39	lengima	39
		manyatta juu	40
		forore	41
		longai	42

Annex 5: Calendar Of events

Calendar of Events of North Horr

LOCAL CALENDER OF EVENTS NORTH HORR COUNTY							
MONTH	**Seasons**	**Arbaa 2013**	**Kamis 2014**	**Gumat 2015**	**Sabdi 2016**	**Ahath 2017**	**Alsinin 2018**
JANUARY	Faite	[redacted]	48	36	24	Faite 12	0
FEBRUARY	1st Jiiborr	GANN 59	47	Bar Dukub Tite 35	23	Jibor 1 11	[redacted]
MARCH	2nd Jiiborr	General Election 58	46	34	22	Jibor 2 10	
APRIL	1st Somdeera	57	Wedding 1 45	33	Kalacha 2 21	wedding 1 9	
MAY	2nd Somdeera	Preparation of Hitu 56	Hitu of Gabra 44	Hitu Gabra 32	Somder 2 20	Weddind 2 8	
JUNE	Som	55	Sorio 43	Ramadhan 31	Ramadhan 19	Ramadhan 7	
JULY	Furam	Bon Agaya 54	42	Obama Visit 30	Furam 18	6	
AUGUST	Didial	1st Kalacha Festival 53	41	Bin 29	17	5	
SEPTEMBER	Arafa	52	Kalazaar 40	Sadet 28	Kalacha Festival 16	4	
OCTOBER	Raqa	51	39	Furam 27	Yaaqa 15	3	
NOVEMBER	Ragar 1	50	38	Almado 26	Ragarr 1 14	2	
DECEMBER	Ragar 2	49	37	Gan Elnino 25	Ragarr 2 13	1	

Calendar of events of Illeret

LOCAL CALENDER OF EVENTS ILLERET							
MONTH	**Seasons**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
JANUARY	Hele	[redacted]	48	36	Oso nyirara 24	12	0
FEBRUARY	War-IL Lrka	59	Gum chief 47	35	23	11	[redacted]
MARCH	War-IL Kinama	58	46	34	22	Oso El-masich 10	
APRIL	War-IL kisethe	57	45	Rabbura 33	21	9	
MAY	War-IL Kintura	56	Osonyilerong 44	32	20	8	
JUNE	Chade	55	43	31	Red cross 19	7	
JULY	Charr	54	42	Obama Visit 30	Um eldhadai 18	6	
AUGUST	Sirinyanyu	53	Shalshal 41	Bire Anyieta 29	17	5	
SEPTEMBER	Garmar	52	Oso 40	28	Oso um hada 16	4	
OCTOBER	Anich	51	Achie gali dherete Akimare 39	27	15	3	
NOVEMBER	Shonoch	50	38	26	Oso nyirara 14	2	
DECEMBER	Guu	49	37	25	13	1	

Calendar of events of Loiyangalani

LOCAL CALENDER OF EVENTS MARSABIT COUNTY -LOYANGALANI WARD/KARGI/S.HORR							
MONTH	**Seasons**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
JANUARY			New year sikukuu 48	New year sikukuu 36	New year sikukuu 24	New year sikukuu 12	Roots in mbt 0
FEBRUARY		General elections 59	47	35	23	11	
MARCH		58	46	34	22	10	
APRIL		57	45	33	Start of long rains- kargi 21	Livestock migration to mbt 9	
MAY		Turkana cultural festival 56	Turkana cultural festival 44	Turkana cultural festival 32	Turkana cultural festival 20	Turkana cultural festival 8	
JUNE		V.m.m.c 55	43	Sarima conflicts 31	19	7	
JULY		54	42	Lmuget lolmooli 30	18	6	
AUGUST		General elections 53	41	29	17	B.s.f.p./ general elections 5	
SEPTEMBER		52	40	28	16	4	
OCTOBER		51	39	27	15	Presidential rerun 3	
NOVEMBER		50	38	26	14	Malarial outbreak rerun 2	
DECEMBER		Christmas 49	Christmas 37	Christmas 25	Christmas 13	Christmas 1	

Calendar of Events of Laisamis

Local calendar of events Marsabit county -Laisamis area							
Month	Seasons	2013	2014	2015	2016	2017	2018
January		[redacted]	New year 48	New year 36	New year 24	New year 12	0
February		59	47	Construction of civic on road 35	23	11	[redacted]
March		general election 58	46	34	start of short	10	
April		57	45	33	21	9	
May		sorio 56	44	32	20	8	
June		long drought 55	43	Long drought 31	19	7	
July		54	42	Iddi 30	18	6	
August		Lmuget 53	41	29	Iddul fitri 17	General elections 5	
September		52	Westgate 40	28	Galsa outbreak	4	
October		Sorio 51	sorio 39	Sorio 27	sorio 15	Galchiri /run off presidential	
November		50	38	26	14	floods in logologo 2	
December		Christmas 49	Christmas 37	Chrismas 25	Christmas 13	Christmas 1	

ANNEX 6: Questionnaires

1.IDENTIFICATION	**1.1 Data Collector**_____	**1.2 Team Leader**_____	**1.3 Survey date (dd/mm/yy)----------**					
1.4 County	1.5 Sub County	1.6 Ward	1.7 Location	1.8 Sub-Location	1.9 Village	1.10 Cluster No	1.11 HH No	1.12 Team No.
1.13 **Household geographical coordinates**	**Latitude**	_____	**Longitude**	_____				

		2. Household Demographics									
2.1	**2.2a**	**2.2b**	**2.3**		**2.4**	**2.5**	**2.6**	**2.7a**	**2.7b**	**2.8**	**2.10**
Age Group	**Please give me the names of the persons who usually live in your household.**	**Please indicate the household head (write HH on the member's column)**	**Age (Record age in MONTHS for children <5yrs and YEARS for those ≥ 5 years's)**		**Childs age verified by** 1=Health card 2=Birth certificate / notification 3=Baptism card 4=Recall 5. other _____ specify	**Sex** 1= Male 2= Female	**If between 3 and 18 years old, Is the child attending school?** 1 = Yes 2 = No (If yes go to 2.8; If no go t o 2.7)	**Main reason for not attending school (Enter one code from list)** 1=Chronic Sickness 2=Weather (rain, floods, storms) 3=Family labour responsibilities 4=Working outside home 5=Teacher absenteeism/lack of teachers 6= Fees or costs 7=Household doesn't see value of schooling 8 =No food in the schools 9 = Migrated/ moved from school area (including displacements) 10=Insecurity/ violence 11-No school Near by 12=Married 13. Pregnant/ taking care of her own child 13=others (specify)…… ……..	**2.7a, What is the child doing when not in school?** **1**=Working on family farm 2=Herding Livestock 3=Working for payment away from home 4=Left home for elsewhere 5=Child living on the street 6: Other specify _____	**What is the highest level of education attained?(level completed) From 5 yrs and above** 1 =Pre primary 2= Primary 3=Secondary 4=Tertiary 5= None 6=others(specify) Go to question to 2.9 ↓	**If the household owns mosquito net/s, who slept under the mosquito net last night? (***Probe- enter all responses mentioned (Use 1 if "Yes" 2 if "No and 3 if not applicable) go to question 2.11*
			Years	Months							

< 5 YRS	1										
	2										
	3										
	4										
>5 TO <18 YRS	5										
	6										
	7										
	8										
ADULT (18 years and above)	13										
	14)										
	15										
	16										

2.9	**How many mosquito nets does this household have? _____ (Indicate no.) go to question 2.10 before proceeding to question 2.11**	
2.11	**Main Occupation of the Household Head – HH.** **(enter code from list)** 1=Livestock herding 2=Own farm labour 3=Employed (salaried) 4=Waged labour (Casual) 5=Petty trade 6=Merchant/trader 7=Firewood/charcoal 8=Fishing **9=** Income earned by children **10=Others (Specify)** |____|	**2.12.** What is the **main** current source of income **of the household?** 1. =No income 2. = Sale of livestock 3. = Sale of livestock products 4. = Sale of crops 5. = Petty trading e.g. sale of firewood 6. =Casual labor 7. =Permanent job 8. = Sale of personal assets 9. = Remittance 10. Other-Specify |____|
2.13	Marital status of the respondent 1. = Married 2. = Single 3. = Widowed 4. = separated 5. = Divorced. |____|	**2.14. What is the residency status of the household**? 1. IDP 2.Refugee 3. Resident |____|
2.15	Are there children who have come to live with you recently? 1. YES 2. NO	2.15b If yes, why did the child/children come to live with you? 1= Did not have access to food 2=Father and Mother left home 3=Child was living on the street, 4=Care giver died 5= Other specify _____

Fever with Malaria: High temperature with shivering	**Cough/ARI:** Any episode with severe, persistent cough or difficulty breathing	**Watery diarrhoea:** Any episode of three or more watery stools per day	**Bloody diarrhoea:** Any episode of three or more stools with blood per day

3.	4.	5. CHILD HEALTH AND NUTRITION (ONLY FOR CHILDREN 6-59 MONTHS OF AGE; IF N/A SKIP TO SECTION 3.6) **Instructions:** *The caregiver of the child should be the main respondent for this section* ***3.1 CHILD ANTHROPOMETRY 3.2 and 3.3 CHILD MORBIDITY*** *(**Please** fill in **ALL REQUIRED** details below. Maintain the same child number as part 2)*

A Child No.	B	C	D	E	F	G	H	I	J	K	3.2 a	3.2 b	3.3 a	3.3 b	3.3 c
	what is the relationship of the respondent with the child/children 1=Mother 2=Father 3=Sibling 4=Grandmother 5=Other (specify)	SEX Female…...F Male ……..M	Exact Birth Date	Age in months	Weight (KG) XX.X	Height (CM) XX.X	Oedema Y= Yes N= No	MUAC (cm) XX.X	Is the child in any nutrition program 1. Yes 2. No If no skip to questions 3.2	If yes to question J. which nutrition program? 1.OTP 2.SFP 3.BSFP Other Specify _____	Has your child (NAME) been ill in the past two weeks? 1.Yes 2. No If No, skip to 3.4	If YES, which illness (multiple responses possible) 1 = Fever with chills like malaria 2 = ARI /Cough 3 = Watery diarrhoea 4 = Bloody diarrhoea 5 = Other (specify) *See case definitions above*	**When the child was sick did you seek assistance?** 1.Yes 2. No	**If the response is yes to question # 3.2 where did you seek assistance? (More than one response possible-** 1. Traditional healer 2.Community health worker 3. Private clinic/ pharmacy 4. Shop/kiosk 5.Public clinic 6. Mobile clinic 7. Relative or friend 8. Local herbs 9.NGO/FBO	If the child **had watery diarrhoea** in the last TWO (2) WEEKS, did the child get: 1. ORS 2. Zinc supplementation? *Show sample and probe further for this component check the remaining drugs(confirm from mother child booklet)*
01															

02															
03															
04															

3.4 Maintain the same child number as part 2 and 3.1 above

	A1	A2	B	C	D	E	F	G	H	I
Child No.	How many times has child received Vitamin A in the past year? (show sample)	Has the child received vitamin A supplement in the past 6 months?	How many times did the child receive vitamin A capsules from the facility or out reach	If Vitamin A received how many times in the past one year did the child receive verified by **Card?**	**FOR CHILDREN 12-59 MONTHS** How many times has child received drugs for worms in the past year? *(show Sample)*	Has the child received BCG vaccination? Check for BCG scar. **1 = scar 2=No scar**	Has child received OPV1 vaccination **1=Yes, Card 2=Yes, Recall 3 = No 4 = Do not know**	Has child received OPV3 vaccination? **1=Yes, Card 2=Yes, Recall 3 = No 4 = Do not know**	Has child received measles vaccination at 9 months *(On the upper right shoulder)?* **1=Yes, Card 2=Yes, Recall 3 = No 4 = Do not know**	Has child received the second measles vaccination (18 to 59 months) *(On the upper right shoulder)?* **1=Yes, Card 2=Yes, Recall 3 = No 4 = Do not know**
01										
02										
03										
04										

3.5 MNP Programme Coverage. ***Maintain the same child number as part 2 and 3.1 above. Ask all the relevant questions (3.5.1 to 3.6.4) before moving on to fill responses for the next child. THIS SECTION SHOULD ONLY BE ADMINISTERED IF MNP PROGRAM IS BEING IMPLEMENTED OR HAS BEEN IMPLEMENTED***

	3.5 Enrolment in an MNP program		**3.6 Consumption of MNPs**			
	3.5.1. Is the child enrolled in the MNP program?(show the example of the MNP sachet) ***(record the code in the respective child's number)*** Yes =1 No=0 **If no go to 3.5.2,** **If yes go to section 3.6.1**	3.5.2 If the child, 6-23months, is not enrolled for MNP, give reason. (***Multiple answers possible. Record the code/codes in the respective child's number. DO NOT READ the answers)*** Do not know about MNPs ……1 Discouraged from what I heard from others ……2 The child has not fallen ill, so have not gone to the health facility …. ……3 Health facility or outreach is far ……4 Ch ild receiving therapeutic or supplementary foods .....5 Other reason, specify ……6 ***Skip to 3.7***	3.6.1 Has the child consumed MNPs in the last 7 days?(shows the MNP sachet) ***(record the code in the respective child's number)*** YES = 1 N0= 0 ***If no skip to 3.6.3***	3.6.2 If yes, how frequent do you give MNP to your child? ***(record the code in the respective child's number)*** Every day ……1 Every other day .....2 Every third day ……3 2 days per week at any day ....4 Any day when I remember.….5	3.6.3 If no, since when did you stop feeding MNPs to your child? ***(record the code in the respective child's number)*** 1 week to 2 weeks ago ....1 2 week to 1 month ago ....2 More than 1 month 3	3.6.4 What are the reasons to stop feeding your child with MNPs? (***Multiple answers possible. Record the code/codes in the respective child's number. DO NOT READ the answers)*** Finished all of the sachets .....1 Child did not like it .....2 Husband did not agree to give to the child .....3 Sachet got damaged ……4 Child had diarrhea after being given vitamin and mineral powder ……..5 Child fell sick.....6 Forgot ……..7 Child enrolled in IMAM program …8 Other (Specify)_____ ..9

Child 1						
Child 2						
Child 3						
Child 4						

MATERNAL NUTRITION FOR WOMEN OF REPRODUCTIVE AGE (15-49 YEARS) *(Please insert appropriate number in the box)*									
3.7	**3.8**	**3.9**	**3.10**			**3.11**			
Woman ID. **(all women in the HH aged 15-49 years from the household demographics – section 2)**	What is the mother's / caretaker's physiological status **1. Pregnant** **2. Lactating** **3. not pregnant and not lactating** **4. Pregnant and lactating**	Mother/ caretaker's MUAC reading: ____.__**cm**	During the pregnancy of the (name of the youngest biological child below 24 months) did you take the following supplements? indicate **1. Yes** **2. No** **3. Don't know** **4. N/A**			If Yes, for how many days did you take? (***probe and approximate the number of days***)			
			Iron tablets syrup	Folic acid	Combined iron and folic acid supplements	Iron tablets syrup	Folic acid	Combined iron and folic acid supplements	

4.0 WATER, SANITATION AND HYGIENE (WASH)/- *Please ask the respondent and indicate the appropriate number in the space provided*			
4.1	**What is the MAIN source of drinking water for the household <u>NOW</u>?** **piped water** piped into dwelling ..... 11 piped to yard / plot ..... 12 piped to neighbour ..... 13 public tap / standpipe ..... 14 tube well / borehole ..... 21 **dug well** protected well ..... 31 unprotected well ..... 32 **spring** protected spring ..... 41 unprotected spring ..... 42 rainwater ..... 51 tanker-truck ..... 61 cart with small tank ..... 71 water kiosk ..... 72 surface water (river, dam, lake, pond, stream, canal, irrigation channel) 81	**4.2 a What is the trekking distance to the current main water source?** 1=less than 500m (Less than 15 minutes) 2=more than 500m to less than 2km (15 to 1 hour) 3=more than 2 km (1 – 2 hrs) 4=Other(specify) |____|	4.2b – Who MAINLY goes to fetch water at your current main water source? 1=Women, 2=Men, 3=Girls, 4=Boys

	packaged water bottled water ..... 91 sachet water..... 92 1.		
4.2.2a	**How long do you queue for water?** 1. Less than 30 minutes 2. 30-60 minutes 3. More than 1 hour 4. Don't que for water 1.	**.3 Do you do anything to your water before drinking? (*MULTIPLE RESPONSES POSSIBLE) (Use 1 if YES and 2 if NO).*** |____| 1. Nothing 2. Boiling…… …… |____| 3. Chemicals (*Chlorine,Pur,Waterguard*)…… |____| 4. Traditional herb……... |____| 5. Pot filters……... |____| 5.	
4.3a	|____|	**6.**	

4.4	**Where do you store water for drinking?** 1. Open container / Jerrican 2. Closed container / Jerrican |____|	**4.5 How much water did your household use YESTERDAY (excluding for animals)?** *(Ask the question in the number of 20 liter Jerrican and convert to liters & write down the total quantity used in liters)* |____|	
4.6	**Do you pay for water?** 1. Yes 2. No **(If No skip to Question 4.7.1**) |____|	**4.6.1 If yes, how much per 20 liters jerrican _____ KSh/20ltrs**	**4.6.2 If paid per month how much** |____|

4.7.1a	We would like to learn about where members of this household wash their hands. Can you please show me where members of your household most often wash their hands? *Record result and observation.* **OBSERVED** FIXED FACILITY OBSERVED (SINK / TAP) IN DWELLING.....1 IN YARD /PLOT.....2 MOBILE OBJECT OBSERVED (BUCKET / JUG / KETTLE)..... 3 NOT OBSERVED NO HANDWASHING PLACE IN DWELLING /	4.7.1b Is soap or detergent or ash/mud/sand present at the place for handwashing? YES, PRESENT .....1 NO, NOT PRESENT..... ……**2**

	YARD / PLOT..... 4 NO PERMISSION TO SEE 5	
4.7.1	**Yesterday (within last 24 hours) at what instances did you wash your hands? (MULTIPLE RESPONSE-** (Use 1 if "Yes" and 2 if "No") 1. After toilet…… 2. Before cooking……... |____| 3. Before eating…… 4. After taking children to the toilet…… |____| 5. Others…… |____| |____| |____|	
4.7.2	**If the caregiver washes her hands, then probe further; what did you use to wash your hands?** 1. Only water 2. Soap and water 3. Soap when I can afford it 4. traditional herb 5. Any other specify |____|	**4.8 What kind of toilet facility do members of your household usually use?** **If 'Flush' or 'Pour flush', probe:** **Where does it flush to?** |____| **If not possible to determine, ask permission to observe the facility.** **flush / pour flush** **flush to piped sewer system 11** **flush to septic tank 12** **flush to pit latrine 13** **flush to open drain 14** **flush to DK where 18**

		pit latrine **ventilated improved pit latrine 21** **pit latrine with slab 22** **pit latrine without slab / open pit 23** **composting toilet 31** **bucket 41** **hanging toilet / hanging latrine 51** **no facility / bush / field 95** 1. **OTHER (specify) 96**

5.0: Food frequency and Household Dietary Diversity

Type of food*	**Did members of your household consume any food from these food groups in the last** *7 days?(food must have been cooked/served at the household)* ***0-No*** ***1-Yes***	**If** *yes*, **mark days the food was consumed in the last 7 days?** ***0-No*** ***1-Yes***								What was the **main** source of the dominant food item consumed in the HHD? **1.Own production** **2.Purchase** **3.Gifts from friends/families** **4.Food aid** **5.Traded or Bartered** **6.Borrowed** **7.Gathering/wild fruits** **8.Other (specify)**	**<u>WOMEN DIETARY DIVERSITY</u>** **ONLY FOR WOMEN AGE 15 TO 49 YEARS. REFER TO THE HOUSEHOLD DEMOGRAPHICS SECTION Q2.3 AND Q2.5** **Please describe the foods that you ate or drank yesterday during day and night at home or outside the home (start with the first food or drink of the morning)** ***0-No*** ***1-Yes***			
		D1	***D2***	**D 3**	**D 4**	**D5**	**D 6**	**D7**	**TOTAL**		Woman ID……	Woman ID…..	Woman ID …….	Woman ID…..
5.1. Cereals and cereal products *(e.g. sorghum, maize, spaghetti, pasta, anjera, bread*)?														
5.2. Vitamin A rich vegetables and tubers: Pumpkins, carrots, orange sweet potatoes														

5.3. White tubers and roots: White potatoes, white yams, cassava, or foods made from roots														
5.4 Dark green leafy vegetables: Dark green leafy vegetables, including wild ones + locally available vitamin A rich leaves such as cassava leaves etc.														
5.5 Other vegetables *(e.g., tomatoes, egg plant, onions)?*														
5.6. Vitamin A rich fruits: + other locally available vitamin A rich fruits														
5.7 Other fruits														
5.8 Organ meat (iron rich): Liver, kidney, heart or other organ meats or blood based foods														
5.9. Flesh meats and offals: Meat, poultry, offal *(e.g. goat/camel meat, beef; chicken/poultry)?*														
5.10 Eggs?														
5.11 Fish: Fresh or dries fish or shellfish														
5.12 Pulses/legumes, nuts *(e.g. beans, lentils, green grams, cowpeas)*?														
5.13 Milk and milk products *(e.g.*														

goat/camel/ fermented milk, milk powder)?														
5.14 Oils/fats *(e.g. cooking fat or oil, butter, ghee, margarine)?*														
5.15 Sweets: Sugar, honey, sweetened soda or sugary foods such as chocolates, sweets or candies														
5.16 Condiments, spices and beverages:														

6. COPING STRATEGIES INDEX		
		Frequency score: Number of days out of the past seven (0 -7).
	In the past 7 DAYS, have there been times when you did not have enough food or money to buy food? If No; END THE INTERVIEW AND THANK THE RESPONDENT **If YES, how often has your household had to:** *(INDICATE THE SCORE IN THE SPACE PROVIDED*)	
1	Rely on less preferred and less expensive foods?	
2	Borrow food, or rely on help from a friend or relative?	
3	Limit portion size at mealtimes?	
4	Restrict consumption by adults in order for small children to eat?	
5	Reduce number of meals eaten in a day?	
	TOTAL HOUSEHOLD SCORE: **END THE INTERVIEW AND THANK THE RESPONDENT**	

	4.1 FOOD FORTIFICATION (FF)/- *Please ask the respondent and indicate the appropriate number in the space provided*
1.1	**Have you heard about food fortification?** 1. Yes 2. No 3. Don't know
1.1.1	**If yes, where did you hear or learn about it? (MULTIPLE RESPONSE ARE POSSIBLE-** (Use 1 if "Yes" and 2 if "No") 6. Radio…… |____| 7. Road show…… |____| 8. In a training session attended…… |____| 9. On a TV show…… |____| 10. Others…… |____| …. |____|

1.2	**Respondent's knowledge on the food fortification logo (Show the food fortification logo to the respondent and record the response). Do you know about this sign?** 1. Yes 2. No 3. Don't know	|____|
1.3	**What is the MAIN source of Maize flour for the household <u>NOW</u>?** 2. Bought from the shops, supermarket e.t.c 3. Maize is taken for milling at a nearby Posho Mill 4. Bought from a nearby Posho Mill 5. Other *(Please specify)* |_____|	**1.1b Do you know if the maize flour you consume is fortified or not?** 1. Yes 2. No 3. Don't know
1.4	**What brands of the following foods does your household consume?** 1. Maize flour 2. Wheat flour 3. Margarine 4. Oils 5. Fats 6. Sugar	|_____| |_____| |_____| |_____| |_____| |_____|