Tiwalere II Project

Baseline Study Report

Funded by: USAID

Implemented by: Feed the Children, Inc., World Relief and Total Land Care

Disclaimer

This report presents key results for Tiwalere II baseline study conducted in 8 districts of Malawi with generous support from Feed the Children Inc. Malawi (abbreviated FEED in the report) and its alliance partners – World Relief and Total Land Care. The opinions expressed herein are those of the authors and do not necessarily reflect the views of FEED and the aforesaid partners.

Recommended Citation

FEED, World Relief and Total Land Care. February 2017. Tiwalere II Baseline Survey Report. Lilongwe, Malawi.

Copies of the publication can be obtained from:

Feed the Children, Inc. Malawi
Area 6, Plot 6/11,
P.O. Box 31611,
Lilongwe 3.

Project Summary

Name of the Project	Tiwalere II
Project Activities	Health and nutrition, hygiene and sanitation, livelihoods interventions
Donor	USAID
Project Lifespan	5 Years (July 2016-June 2021)
Implementing Organization	Feed the Children, Inc., World Relief and Total Land Care
Key Stakeholders	Malawi Government District Assemblies The USA-based NuSkin, INC., Proctor and Gamble Other NGOs in the project districts
Project Goal	To improve the nutritional status of children under five years of age, pregnant and lactating women (PLW), and adolescent girls in 12 districts in Malawi by 2021
Targeted Districts	Chitipa, Karonga, Rumphi, Nkhata-Bay, Nkhotakota, Salima, Dowa, Lilongwe, Mchinji, Balaka, Machinga and Mangochi
Key Result Areas (KRAs)	2. Improved nutrition and health of 426,259 children under five years of age, 120,529 PLW and 129656 adolescent girls (15-19 years old) by June 2021 3. Increased availability and access to foods rich in micronutrients and protein among 298,608 households with pregnant women and children under five (5) years of age by June 2021. 4. Improved adoption of essential hygiene actions and increased access to safe water by 298,608 households with pregnant women and children under five years (5) of age by June 2021.
Purpose of the Baseline Survey	The main purpose of this baseline survey is to establish benchmark information that will be used for subsequent monitoring and evaluation of the program's success in achieving its stated goal and objectives

Acknowledgements

In December of 2016, we visited areas 8 districts in Malawi to collect primary quantitative and qualitative data from the people to establish benchmarks for Tiwalere II project. The study recruited research assistants, supervisors, data entry clerks, health surveillance assistants and drivers to perform different duties on the ground. To all of you, for the time, patience and diligence provided throughout the process, the authors – William Kasapila, Joseph Chimungu and Dan Nyirenda- are deeply thankful.

We would like to acknowledge FEED, World Relief and Total Land Care staff at various levels for their commitment as well as logistical, technical and financial support that made the work easy to carry out.

We also wish to appreciate the cooperation that our teams received from many very helpful people, including key stakeholders, individuals and groups of interest that devoted time to participate on this study.

Sincere gratitude should also go to local leaders and other influential people at community level who helped to mobilize mothers, caregivers, adolescent girls and children under five years to participate in the study at a time when people were very busy working in their gardens.

Table of Contents

List of Acronyms

ARI:	Acute Respiratory Infections
BCC:	Behavior Change Communication
BCG:	Bacille Calmette Guerin
CBCC:	Community Based Childcare Centers
CLTS:	Community-Led Total Sanitation
CMAM:	Community Management of Acute Malnutrition
CSI:	Coping Strategy Index
DPT:	Diphtheria, Pertussis and Tetanus
DSWO:	District Social Welfare Office
EPI:	Expanded Programme on Immunization
FAO:	Food and Agriculture Organization
FCS:	Food Consumption Score
FTC:	Feed the Children Inc.
GVH	Group Village Headman
HDDS:	Household Dietary Diversity Scale
HSA	Health Surveillance Assistants
HWT:	Household Water Treatment
IGAs:	Income Generating Activities
KRAs:	Key Result Areas
LQAS	Lot Quality Assurance Sampling
MNCH:	Maternal, Newborn and Child Health
MUAC:	Mid Upper Arm Circumference
NNPSP:	National Nutrition Policy and Strategic Plan
NRUs:	Nutrition Rehabilitation Units
NSP:	National Sanitation Policy
OVC:	Orphans and Other Vulnerable Children
PLW:	Pregnant and Lactating Women
SDGs:	Sustainable Development Goals
SPSS:	Statistical Package for Social Scientists
SUN:	Scaling up Nutrition
TORs:	Terms of Reference
UNSCN:	United Nations Standing Committee on Nutrition
USAID:	United States Agency for International Development
WASH:	Water, Sanitation and Hygiene
WDDS:	Women Dietary Diversity Score
WHO:	World Health Organization

Executive Summary

Background

The main purpose of this baseline study was to establish benchmark information that will be used in the subsequent monitoring and evaluation of Tiwalere II project's success in achieving its stated goal and objectives. Tiwalere II project is a five-year (July 2016-June 2021) $39.4 million, USAID-funded collaborative project implemented in 12 districts of Malawi by Feed the Children, Inc. and its alliance partners, namely World Relief and Total Land Care. The goal is to improve the nutritional status of 426,259 children under five years of age, 120,529 pregnant and lactating women (PLW), 178,079 mothers of children under two years of age, and 129,656 adolescent girls, drawing from the lessons and successes of Tiwalere I and other similar projects. Tiwalere II districts are Chitipa, Karonga, Rumphi, Nkhata-Bay, Nkhotakota, Salima, Dowa, Lilongwe, Mchinji, Balaka, Machinga and Mangochi. Eight of these districts will receive the full set of interventions being priority areas. Rumphi, Nkhata-Bay, Balaka and Machinga are additional districts that will receive support for community-based childcare centers (CBCCs). Besides World Relief and Total Land Care, Feed the Children Inc. is committed to working together with the government of Malawi, District Assemblies, the USA-based NuSkin, Inc. and Proctor and Gamble.

Baseline Study Design and Methodology

Using LQAS (Lot Quality Assurance Sampling), this study designed to interview mothers of children 0-59 months from 57 households in each of the 31 project TAs (e.g. supervision areas) in the 8 primary districts, giving a total of 1767 households. The study also planned to carry out an exhaustive anthropometric survey of children 6-59 months and adolescent girls 15-19 years to investigate issues of diet adequacy and micronutrient intake. Household and anthropometric surveys were conducted from 4-23 December 2016 by trained and experienced enumerators recruited by the consultants. Data obtained were entered in the relevant computer software packages for analysis and interpretation. Qualitative data from individual and group interviews were analyzed manually through content analysis and reported as anecdotes to contextualize the quantitative results. Quality during field work was ensured by close supervision and mentorship of enumerators by the consultants, supervisors and Tiwalere II project staff. This task involved ensuring that the household survey methodology was followed closely, checking the completeness of the questionnaires, and conducting debriefing sessions with enumerators regularly to discuss and rectify any problems encountered in the field.

Summary of the Results

Indicator	Results
Improving nutritional status of children under five and women of reproductive age (15-49 years)	
Prevalence of stunting among children under -5 years (global)	38.7
Prevalence of wasting among children under-5 years (global)	7.5
Prevalence of underweight among children under-5 years (global)	16.4
Prevalence of underweight women	8.8
Proportion of female teen group members who have a hemoglobin ≥ 12.0 mg/dl	
Improving feeding practices of children under five years old	
% of children 6-23 months of receiving a minimum acceptable diet	7.8
Excusive breastfeeding (BF) under 6 months of age: Proportion of infants 0–5 months of age who are predominantly breastfed MDD-W)	82.7
Continued BF at 1 yr.: % of children 12 -15 months of age who are fed breast milk	95.5
Continued BF at 2 yrs.: % of children 20-23 months of age who are fed breast milk	91.4
Increasing consumption of foods rich in micronutrients & protein by PLW	
Minimum Dietary Diversity Score of women (MDD-W): % of PLW in the project who are consuming a minimum dietary diversity	51.8
Minimum Dietary Diversity Score among adolescent girls in the project who are consuming a minimum dietary diversity	69.4
Number (cumulative) of children who received Vitameal	
Coverage of key health & nutrition services for children under 5 & pregnant women improved (i.e. Vitamin A Supplementation, deworming, screening/referral for acute malnutrition, family planning & ANC)	
% of pregnant women who attended ANC during the first trimester	43.9
% of deliveries conducted by skilled health workers (doctor, nurse or mid-wife)	98.6
% of women giving birth in the past year who received first ANC visit during first trimester	
Improving access to and usage of key nutrition services	
% of children 6-59 months who received a vitamin A supplement in the past six months	90.6
Proportion of children 12-59 months who received deworming medicine in the past six months	
Number of HSAs and CGVs trained in existing referral system	
% of children 0-59 months who had their growth monitored in the previous month	76.1
Number of cases of acute malnutrition in children 6 -59m detected who are referred for treatment	

Improving male support for RMNCH	
MCPR: Modern Method Contraceptive prevalence rate	62.2
% of males accompanying female partner to ANC at least once during most recent pregnancy	37.2
The identification, prevention, and timely management of key childhood illnesses improved	
% of children under age five who had diarrhea in the prior two weeks	16.2
% of children under five years old with diarrhea treated with Oral Rehydration Therapy (ORT), or an appropriate home-based solution and / increased fluids	52.7
% of children 0-59 months with diarrhea for whom advice/treatment was sought from health facility or provider	97.4
% of children under age five with cough and rapid or difficult breathing taken to a health facility	3.8
% of children 0-59 months with fever for whom advice/treatment was sought from health facility or provider	51.3
% of caregivers of children 0-23 months who were able to cite at least two danger signs of common infection in children needing medical attention	
% of children 12-23 months old, in program catchment area, fully immunized by age one	51.1
% of pregnant women/ mothers of children 0-23m who slept under an ITN the previous night	100
% of children 0-23 months who slept under an ITN the previous night	98.0
% of children under five years of age with diarrhea in the two weeks preceding the survey who received ORS and or zinc	72.4
% of children under five years of age with fever, fast/difficult breathing, or diarrhea in the two weeks preceding the survey who were offered more than usual to drink (including breast milk)	
% of children under five years of age with fever, fast/difficult breathing, or diarrhea in the two weeks preceding the survey who were offered more than usual to eat	
% of children under five years of age who had bloody or persistent diarrhea for whom care was sought	
% of health workers who can manage cases of child illness among children under five years of age in accordance with the national policy	
Improving micronutrient status among girls 15-19	
Average Household Dietary Diversity score	6.15
Daily per capita expenditures (as a proxy for income) in USG-assisted areas	
% (cumulative) of households with gardens producing foods rich in micronutrients and protein	10.5
% (cumulative) of households producing small livestock	10.7
% of farmers who used improved storage practices in the past 12 months	

Number of farmers and others who have applied improved technologies or management practices	78.3
# of hectares under improved technologies or management practices	1091.8
# of individuals who have received USG supported short term agriculture sector productivity or food security training	
Household income increased	
Daily per capita expenditures (as a proxy for income)	
% of beneficiaries who used financial services (savings/loans) in the past three months	3.1
Total savings deposits by members of financial services (VSL)	MK446,800
Women's Empowerment in Agriculture	
Access to and usage of safe water facilities and products improved	
% of households with access to safe drinking water	58.5
Average time (in minutes) needed to fetch drinking water	25.56
% of households using an improved drinking water source	58.5
Number of water points developed, repaired, or rehabilitated	
Average number of days in the past month water points are functional	
Number of village water point committees created/trained	
% of households in target areas practicing correct use of recommended household water treatment technologies	74.4
Number of water point committees and VHC trained in water treatment and storage	
Number of people receiving P&G Purifier of Water	
EHA are adopted by members of HHs with children under the age of five	
% of households using an improved drinking water source	
% of households practicing three or more of the five EHA	
Number of HSAs and CGVs trained	

Conclusions and Recommendations

The goal of Tiwalere II is to improve the nutritional status of children under five years of age, pregnant and lactating women (PLW), mothers of children under two years of age, and adolescent girls.

This pre-harvest baseline study conducted in December 2016 found that child stunting was of major concern in all the districts visited, with 39 in every 100 children under five years age (38.7%) suffering from it. The survey found that in every 100 children 5 were born already deprived and underweight (considered as weight of less than 2500 grams at birth).

The causes of malnutrition were many and include, but were not limited to, suboptimal child feeding practices, inadequate diet, frequent incidences of diseases among young children, and the low socioeconomic status and poor nutritional conditions of many mothers.

Similarly, diets of mothers and adolescents were too poor to offer adequate amounts of macro and micronutrients due to poor harvests in the 2015/2016 agricultural season. The problem was compounded by lack of financial services, loans and income opportunities, and NGOs working in areas of food, nutrition and livelihood security.

Tiwalere II project proposes to reduce vulnerability to food and nutrition insecurity by embracing an overarching mix of interventions that have proven effective at eradicating suffering and undernutrition among women, adolescents and children under five. The empirical evidence from this study and the local context at hand validates the relevance of the project to be implemented as designed. Notwithstanding the comprehensiveness of the interventions, as already hinted Tiwalere II is threatened by climate change and poor weather conditions typical of the recent years that thwart people's efforts to harvest adequate food for own consumption.

As part of the nutrition-sensitive agriculture and in addition to soil and water conservation measures under this project, Feed the Children and its alliance partners should (through care groups and easy to understand IEC materials) include resilience-building activities that communities need to prevent, prepare and manage shocks and repercussions of natural disasters. As an example, strengthening of winter cropping (e.g. through messages and provision of planting materials and inputs) can complement well with VSL and 'the pass on the gift livestock' interventions of Tiwalere II and impact hugely in the lives of many people across the project districts.

1.0 Introduction

Tiwalere II is a five-year (July 2016-June 2021) $39.4 million, USAID-funded project awarded to Feed the Children, Inc. and its Alliance Partners, namely World Relief and Total Land Care. The same partners worked together under Tiwalere I to improve the well-being of orphans and vulnerable children (OVC) in the country from August 2010 through July 2015.

The goal of Tiwalere II is to improve the nutritional status of 426,259 children under five years of age, 120,529 pregnant and lactating women (PLW), 178,079 mothers of children under two years of age, and 129,656 adolescent girls in 12 districts as direct beneficiaries, drawing from the lessons and successes of Tiwalere I and other similar projects. Targeted districts are Chitipa, Karonga, Rumphi, Nkhata-Bay, Nkhotakota, Salima, Dowa, Lilongwe, Mchinji, Balaka, Machinga and Mangochi. Eight of these districts will receive the full set of interventions being priority areas. Rumphi, Nkhata-Bay, Balaka and Machinga are additional districts that will receive support for community-based childcare centers (CBCCs).

The project will reach out to 1,125 CBCCs and 94,943 pre-school children aged 3-5 years providing them with school feeding programme throughout the project's lifespan. VitaMeal, a maize-soya blend fortified with vitamins and minerals, will be used in this regard.

In this project, Feed the Children Inc. Malawi and its alliance partners will be collaborating with the Government of Malawi (GoM), the USA-based NuSkin, INC., that will be providing VitaMeal, a corn and soya flour blend fortified with multiple vitamins and minerals for the school feeding programme, and Proctor and Gamble to help with water purification sachets for communities with unsafe water sources.

Malnutrition is endemic in the country and the single biggest contributor to child mortality. The MICS-MDG Endline Survey of 2014 found that 42.4% of children under five year of age are stunted in Malawi, 16.7% underweight and 3.8% wasted. The Malawi Demographic Health Survey (MDHS) of 2015/2016 also reported stunting (referred to as chronic malnutrition or low height for age) as of particular concern in the country, with 37 in every 100 children under five (37.1%) suffering from it – some of them born already short. In addition, 11.7% of the children under five are underweight and 2.7% wasted in the country according to this survey.

While there has been a significant fall in these indicators in recent years they are still unacceptably high when compared to the WHO standards with a threshold of less than 20%. Undernutrition puts children at far greater risk of death and severe illness due to common childhood infections, such as pneumonia, diarrhea, malaria, HIV and AIDS and measles. A child who is severely underweight is 9.5 times more likely to die of diarrhea than the one who is not, and for a stunted child the risk of death is 4.6 times higher.

Recognizing the need for M&E in humanitarian projects, Feed the Children, Inc. and its alliance partners commissioned this baseline study to understand behaviors that act as barrier to achieve optimal maternal and child nutrition and health.

1.1 Tiwalere II Project Goals and Objectives

Goal: To improve the nutritional status of children under five years of age, pregnant and lactating women (PLW), and adolescent girls in 12 districts in Malawi by 2021

Beneficiary

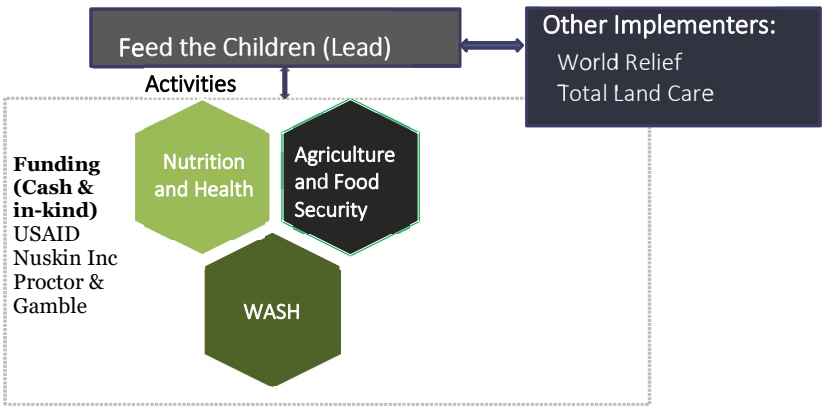
- ✓ 426,259 children under five.
- ✓ 120,529 PLW.
- ✓ 129656 adolescent girls (15-19 years).
- ✓ 298,608 HHs with pregnant women and children under five.

Key Result Areas (KRAs)

1. Improving nutrition and health of children under five, PLW and adolescent girls.
2. Increasing availability and access to foods rich in micronutrients and protein.
3. Improving adoption of essential hygiene actions and increased access to safe water by households in the targeted communities.

1.2 Tiwalere II Project Design and Interventions

In this project, Feed the Children and its alliance partners are committed to implementing a mix of overarching interventions – nutrition and health, agriculture and WASH (water, hygiene and sanitation) - to improve the general welfare and livelihoods of the people in the targeted districts.



3.0 Baseline Survey Design and Methodology

3.1 Inception Meeting

At the very beginning of this study, the consultants held an inception meeting with FEED and its alliance partners to clarify the scope of work, data needs and sampling issues as well as collect relevant documents for review and agree on logistics.

3.2 Sampling Technique and Procedure

LQAS (Lot Quality Assurance Sampling) was used to determine the sample size for the study. The baseline designed to interview 57 households in each of the 31 TAs (e.g. supervision areas) targeted by the project in the 8 primary districts, giving a total of 1767 households. The plan was to engage 589 households for each of the following child age groups: (0-5 months), 6-23 months and 24-59 months. Simple random sampling was used to select two group village headmen's (GVH) areas in each TA as clusters for the study. In each GVH, the study interviewed either 28 or 29 households - the target was to purposively select 19 households with children in the aforesaid age groups for interviews in each TA. Probability Proportionate to Size (PPS) sampling was used to determine the number of households to be interviewed in each district. PPS sampling provide greater chances to select more households from districts with larger population sizes. **Table 1** shows the number of households designed for Mangochi and Dowa to illustrate the aforesaid sampling procedure.

Table 1: The number of sampled households for Mangochi and Dowa

District	T/A	GVH	Households Categories (Child age in months)			
			0 - 5	6 – 23	24 - 59	Total
Mangochi	Jalasi	Namwera	9	10	9	**28**
		Namwera	10	9	10	**29**
	Bwana Nyambi	Lumeta	9	10	9	**28**
		Mmenyanga	10	9	10	**29**
	Katuli	Kwitunji	9	10	9	**28**
		Mpita	10	9	10	**29**
		Sub Total	**57**	**57**	**57**	**171**
Dowa	Chakhaza	Chakhaza	9	10	9	**28**
		Mlangali	10	9	10	**29**
	Msakambewa	Kamphasi	9	10	9	**28**
		Tsindwi	10	9	10	**29**
		Sub Total	**38**	**38**	**38**	**114**

Basically, LQAS is used to guide management decisions and answer with confidence whether specific areas perform below or above a determined threshold.

Since it attempts to only answer yes/no questions, LQAS allows working with small samples. Sample sizes of 19 (19 households, 19 health workers, 19 activities performed by a health worker) offer a high level of precision for decision-making.

> For example:
> *Imagine that the expected level of performance for measles coverage in all our supervision-areas is 70%. A 19:9 decision rule (meaning that nine non-immunized children would be "accepted" in each sample of 19 children randomly selected from one supervision-area) will allow the project manager to discriminate low from high coverage areas with a high specificity.*

3.3 Determination of households for the study

Upon arrival in each cluster, the baseline study teams contacted group village headmen (GVH), village chiefs, and health surveillance assistants (HSA) to collect information on the number of villages together with the average number of under five children per village.

Based on this information, the study teams listed all the households with under five children residing in the selected clusters. As the sample size for each group of children was pre-determined, separate lists were prepared for households with children of ages 0-5, 6-23 and 24-59 months. For households that had more than one eligible child, the teams selected one child (using lottery method) and included them on the list that corresponded to the child's age.

To avoid collection of data from the same household by members of the team, the supervisors allocated the selected households to the specific enumerators using the name of the household heads and identification number of households.

3.4 Selecting respondents to participate in the study

Enumerators conducted interviews with mothers (or caregivers if it was not possible to interview the mother) of index children between 0-59 months of age who were sampled for the survey. After the interviews, women of 15-49 years of age who were non-pregnant, pregnant or lactating during the time of the survey were measured.

3.5 Adolescent Girls

Apart from interviewing the mother or primary caregiver of the child, the study interviewed adolescent girls (15-19 years) from both sampled and unselected

households in the cluster (e.g. an exhaustive survey) to assess adequacy of diets with respect to macro and micronutrient intake.

3.6 Selection of Children for Anthropometric Measurements

In addition to measuring women and adolescent girls, the study included an exhaustive anthropometric survey of children under five years of age (6-59 months) to assess their nutritional status. Health Surveillance Assistants (HSAs) available in the communities invited and measured children from all the households (whether sampled or not) in the selected group village headman (GVH) areas. HSAs are the ones entrusted to do this type of work in the rural communities routinely and have been used successfully in previous surveys by NGOs, including Feed the Children Inc., Malawi. Taking anthropometric measurements from a large number of children ensured reliability and increased generalization of the results obtained.

3.7 Qualitative Assessment

Qualitative data were collected concurrently with the household survey to elicit responses that were quite independent of each other.

i. Key informant interviews: The consultants consulted a number of key persons in each district such as the District Commissioner (DC), District Social Welfare Officers (DSWO), the District Health Officer (DHO), Government Frontline Workers (FLWs), and a cadre of development facilitators who are in closest contact with individuals, households and communities (also known as primary agents of change) and community leaders.

ii. Focus Group Discussions (FGDs) were conducted with groups of 5-11 people selected purposively for their first-hand information. Discussions centered on selected topics with planned questions, while allowing for interesting, new or unplanned follow up questions to be asked also.

3.8 Training and Orientation of Research Assistants

The training of enumerators took place at Eximius Lodge and Gardens in Area 49 for four days from 28 November to 3 December 2016. It covered a number of topics:

i. Baseline survey methodology, and work performance expected
ii. Roles and responsibilities of team members
iii. An overview of food, nutrition and livelihood security, malnutrition, maternal, newborn and child health (MNCH), infant and young child feeding (IYCF), early childhood education, community-led total sanitation (CLTS), economic empowerment of rural households etc.
iv. Interview techniques and filling of the questionnaires
v. Ethics in data collection (time management, respect of respondents etc.)
vi. Pre-testing of research tools as well as data management after collection.

3.9 Pre-testing of Baseline Study Questionnaire

After the training, on 3 December 2016 a pre-test exercise was carried out in TA Chiseka (Lilongwe) prior to the actual data collection. The pre-test subjects did not form part of the final sample. The exercise helped enumerators to get familiarized with the questionnaire, practice the methodology for the study and identify difficult-to-understand questions requiring revisions.

3.10 Field Work

Field work took place from 4-23 December 2016. Household data were collected by 16 enumerators divided into two teams **(Table 2)**. Considering the aforesaid sample size of 1767 households, time spent for lunch and travelling to and within districts as well as the need to ensure accuracy in data collection, each enumerator was expected to administer 7 questionnaires in a day. In addition, the enumerators were also required to work together and interview adolescent girls available in the surveyed GVHs.

Table 2: Itinerary for field work

#	Date	Team 1 (7 Enumerators)	Team 2 (9 Enumerators)
1	4-7 Dec 2016	Chitipa	Mangochi
2	8-11 Dec 2016	Karonga	Mchinji
3	12-15 Dec 2016	Nkhotakota	Lilongwe
4	16-18 Dec 2016	Salima	Dowa
			Salima

3.11 Supervision during fieldwork

The consultants and project staff were together with the survey teams in the field to supervise them. Supervision involved ensuring that the survey methodology is followed closely, checking completeness of questionnaires, making sure anthropometric measurements are taken correctly as well as discussing and rectifying any problems encountered in the field.

3.12 Ethical Considerations

In this study, participation was based on full consent from the respondents, ages 15 and above. Mothers and caregivers also provided consent for anthropometric measurements to be taken in children. Prior to administering the household questionnaire, enumerators informed the respondents that participation was voluntary, highlighting on people's rights to refuse participation, skip questions they did not want to answer, and to discontinue their participation at any time. They assured the respondents that there would be no consequences for exercising these rights. Each respondent was also informed about the confidentiality of the information that they

were asked to provide. Baseline study teams abided by their professional ethical conduct, such as neutrality, respect for respondent's dignity, culture and data verification, throughout the period of field work. Completed questionnaires were not shared with anyone outside the study team. Written formal consent was deemed unnecessary because all respondents were from the targeted communities and would likely benefit from the project interventions in the months to come.

3.13 Data Entry, Analysis and Presentation

SPSS computer software package (version 20.0) was used to analyze quantitative data from the household survey. Descriptive statistics, such as frequencies and percentages, was generated and used to describe the findings. In addition, cross tabulations were used to disaggregate the quantitative data by district, TA, sex and age. Graphs, tables and photographs have been used to put illustrations in the report, where necessary.

Child anthropometric data were analyzed in EPI info. Z scores were generated and used to compare each child's anthropometric measurements to the WHO (2006) reference standards compiled based on a multi-country study (Brazil, Ghana, India, Norway, Oman and USA) on growth of healthy breast-fed children under optimal conditions. Z-scores are an indication of the distance of a child, in standard deviations, away from the mean for his/her age group and were calculated for the following indicators: Height-for-Age (for stunting), Weight-for-Age (underweight) and Weight-for-Height (referred to as wasting).

Qualitative data from key persons, group discussions and simple observations were analyzed manually through content analysis and reported as anecdotes to contextualize quantitative findings.

3.14 Interpretation of the nutrition data

Table 3: *Cut-off points for acute and chronic malnutrition in children under five*

Malnutrition	Degree of Malnutrition	Definition using z-score	Definition using % of median
Wasting and Stunting	None/Mild	≥ -2.0	≥ 80%
	Moderate	≥ - 3.0 but <-2.0	≥70% but <80%
	Severe	<-3.0 or edema	<70% or Edema
Global	Moderate + Severe	<-2.0 and/or Edema	<80% and/or Edema
Severe	Severe	< - 3.0 and/or Edema	<70% and/or Edema

Table 4: *Classification for assessing severity of malnutrition among children under five*

Indicator	Severity of malnutrition			
	Low	Medium	High	Very High
Wasting	<5%	5-9.9%	10-14.9%	≥15%
Underweight	< 10%	10-19%	20-29%	≥30%
Stunting	<20%	20-29.9%	30-39.9%	≥40%

Table 5: *Cut-off points and actions for acute adult under-nutrition*

Nutritional Status	MUAC (mm)	Action
Normal	> 185	Do not admit
Moderate Acute Malnutrition (MAM)	160-185	Supplementary feeding
Severe Acute Malnutrition (SAM)	< 160	Therapeutic feeding
Global Acute Malnutrition (GAM)	≤ 185	Supplementary and Therapeutic feeding

4.0 Quality Assurance and Control

The consultants and supervisors ensured quality of the data collected by using the following measures:

i. Working closely with Feed the Children and its alliance partners.
ii. Training all enumerators to ensure uniformity in taking anthropometric measurements and administration of the household questionnaires.
iii. Making frequent unannounced spot checks on the teams in the field.
iv. Ensuring that the methodology was followed closely.
v. Ensuring that all anthropometric instruments were checked and calibrated every morning during field work e.g. checking the accuracy of the scales by using a known weight such as 1kg packet of sugar or rice etc.
vi. Organizing evening wrap-up sessions with all the teams together to discuss any problems encountered and observations made.
vii. Visiting some of the children to check and verify cases of edema.

5.0 Key Indicator Results[1]

Project Goal: To improve the nutritional status of children under five years of age, pregnant and lactating women (PLW), and adolescent girls in 12 districts in Malawi by 2021.

5.1 Child Malnutrition

The overall distribution of the sample in terms of age and sex (boy: girl) was acceptable (Table 6).

Table 6: *Distribution of age and sex of sample*

AGE (Months)	Boys		Girls		Total		Ratio
	no.	%	no.	%	no.	%	Boy:girl
6-17	484	49.4	496	50.6	980	26.1	1.0
18-29	427	47.1	480	52.9	907	24.2	0.9
30-41	392	48.9	409	51.1	801	21.4	1.0
42-53	334	45.4	401	54.6	735	19.6	0.8
54-59	169	51.5	159	48.5	328	8.7	1.1
Total	1806	48.1	1945	51.9	3751	100.0	0.9

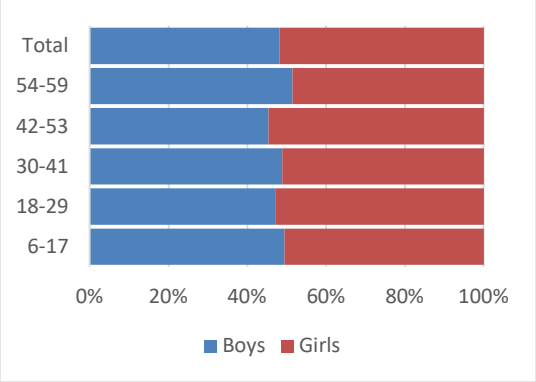


Figure 1: Population age and sex

5.2 Anthropometric results (*based on WHO standards 2006*)

One key objective of Tiwalere II project is to reduce child undernutrition in the country over the coming 5 years (July 2016-June 2021) of its implementation. As already pointed out, undernutrition puts children at far greater risk of death and severe illnesses.

[1] Demographic characteristics of the respondents are presented in Annex 1

In this study, health surveillance assistants (HSAs) measured a total of 3803 children 6-59 months of age[2] to assess their nutritional status for Tiwalere II to make appropriate programmatic decisions **(Table 7)**.

Table 7: Child undernutrition disaggregated by gender, age and district (%)

	Stunting Moderate + Severe	Underweight Moderate + Severe	Wasting Moderate + Severe
Sex of the child			
Boys	42.7	18.8	9.7
Girls	35.0	14.2	6.8
Age in months			
6-17	28.7	11.4	8.4
18-29	42.8	18.0	9.5
30-41	45.7	17.5	4.6
42-53	39.6	17.8	6.5
54-59	39.5	22.4	8.3
District			
Chitipa	37.8	13.5	5.8
Karonga	26.9	21.4	15.1
Nkhotakota	43.4	25.5	7.6
Salima	35.7	10.6	5.1
Lilongwe	41.2	19.4	8.1
Dowa	39.1	15.1	7.3
Mchinji	41.1	13.4	5.5
Mangochi	46.4	14.9	5.5
Total	**38.7**	**16.5**	**7.5**

Levels of Stunting

Analysis of anthropometric data collected from children under five years (6-59 months) showed that stunting was high and widespread in Tiwalere districts. In total, 1473 of the 3803 children measured for this indicator or 39 in every 100 children (38.7%) were stunted; 24.4% moderately and 16.9% severely stunted.

Boys were biologically (42.7%) more stunted than girls (35%) across the districts. Stunting increased with age and varied across the districts, with Mangochi, Nkhotakota, Lilongwe and Mchinji registering higher percentages than the other districts **(Table 7).**

[2] This figure (N=3803) is different from the one presented in Table 6 for the total sample of the children (e.g. 3751) because data for child's age was missing for 87 children and as such the empty cells were not counted for in the cross tabulations, hence 3751. Otherwise, the total number of children measured was 3803.

The lowest stunting rate was found in Karonga at 26.9%. While there has been a significant fall in the prevalence of stunting across the districts, the current figures remain unacceptably high when compared to the WHO's threshold for severity of stunting set at <20% for normal or acceptable situation.

After a child reaches 2 years of age, it is very difficult to reverse stunting or growth retardation that occurred earlier.

Malawi is focusing on community-based action, with the 1,000 Special Days as summed up in the Scaling Up Nutrition (SUN) Global Policy Brief being prioritized to reduce stunting among children under 2 years of age.

Underweight

In this survey, 16.5% of the children were underweight; 11.1 % suffered from moderate underweight and 5.3% weighed severely too little for their ages. Child underweight was most common in Nkhotakota (25.5%), Karonga (21.4%) and Lilongwe (19.4%) and least in Salima (10.6%), particularly among children 6-17 months.

Underweight is a result of both chronic and acute nutritional deprivation. Weight is known to change very rapidly due to frequent incidences of illnesses, suboptimal child feeding practices, low socioeconomic status and poor nutritional conditions.

The weight of children who are classified as underweight is lower than their expected weight according to their age and when compared to weight of children of the same age from a reference population.

In **Figure 2**, the graphs depict that stunting, underweight and wasting were widespread with some children suffering from mixed forms of undernutrition particularly in districts with peaks such as Nkhotakota and Lilongwe. In general, the nutritional situation was favorably better in Salima than the other districts.

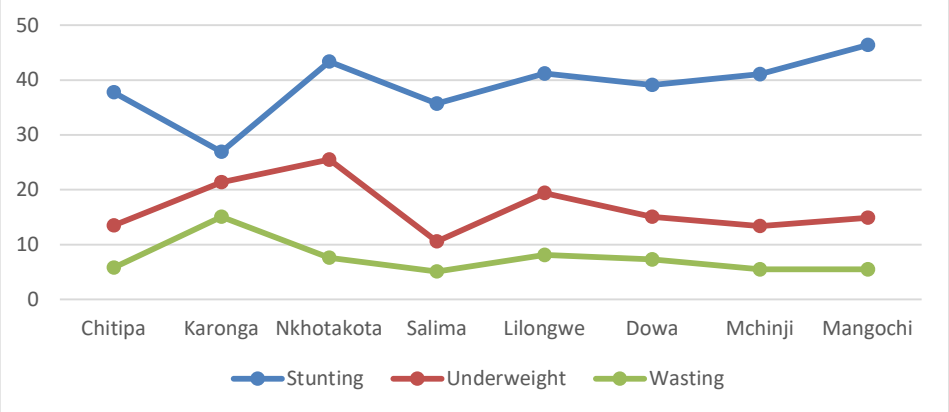


Figure 2: Stunted, underweight and wasted children in the survey areas (%)

Wasting or Acute Malnutrition

Wasting reflects current nutritional deficit. It is usually a result of recent food shortages, poor nutritional and diet practices and current illnesses that result in rapid loss of weight and body tissues. Marasmic children are extremely thin and those with Kwashiorkor are edematous.

Analysis of descriptive data from the anthropometric survey showed that 7.5% of the children were wasted – 9.7% in boys and 6.8% for girls. The acceptable level of underweight is <5% according to the WHO's thresholds.

Wasting was more problematic in children 18-29 months (9.5%), 6-17 month (8.4%) and 54-59 months (8.3%) particularly in Karonga, Nkhotakota, Lilongwe and Dowa, which are some of the districts affected severely by hunger in the country.

In the 2015/2016 agricultural season, erratic rains and prolonged dry spells due to El Nino, which FEWSNET and SADC Agromet have described as the worst ever in the past 35 years, frustrated people's efforts to harvest adequate food.

When the survey took place in December, a rainy and critical month of the year, food shortages had already deteriorated and cases of malaria and diarrhea were common.

Anthropometric results of children from this survey compare favorably well with those from the Malawi Demographic Health Survey (MDHS) of 2015-2016 and the MICS-MDG Endline Survey of 2014 **(Figure 3)**, with exception of wasting as explained above.

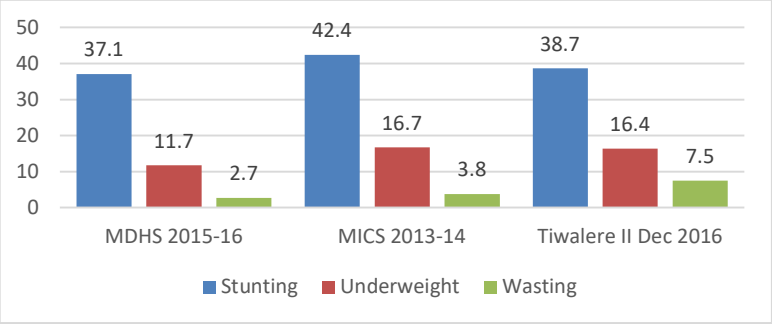


Figure 3: Child undernutrition in MDHS, MICS and Tiwalere II project

5.3 Maternal Nutritional Status

Maternal Underweight

Weight and height measurements were taken on 1,200 women who were available during the time of the study. The values obtained were used to calculate body mass index (weight in kg divided by height [m^2]) to assess levels of underweight in women.

The results obtained showed that 8.8% of the aforesaid women (n=105) were underweight (BMI≤18.5Kg/m^2) and of these 2.4% were severely underweight (n=29).

Maternal suboptimal nutrition during pregnancy results in intrauterine growth restriction (IUGR) and newborns with low birth weight. Ninety six women (8%) were reportedly pregnant when measurements were taken.

Maternal Acute Malnutrition

In this survey, mid upper arm circumference (MUAC) measurements were taken from women, whether their children were measured or not, to assess levels of acute malnutrition.

Only thirteen of the 2,399 women measured (0.5%) were acutely malnourished (MUAC ≤ 185mm), depicting a normal and acceptable situation based on MUAC indicator.

KRA 1: Improved Nutrition and Health of 426,259 Children under Five Years of Age, 120,529 PLW and 129656 Adolescent Girls (15-19 Years Old) By June 2021.

IR 1.1 Feeding practices of children under five years of age and PLW improved

Optimal nutrition during the first 2 years of a child's life lowers morbidity and mortality, reduces the risk of chronic diseases, and promotes healthy growth and development. In this study, assessment of IYCF practices was based on international guidelines - *Indicators for assessing infant and young child feeding (IYCF) practices: Conclusions of a consensus meeting held from 6–8 November 2007 in Washington, DC, USA*. **Table 8** shows the results from households with children 0-23 months (n=1152). **Annex 2** shows more details about the cut off points and classification for IYCF indicators.

Table 8: Results for IYCF indicators for children 0-23 months of age

Indicator	Result (%)	Classification
Children ever breastfed (N=1152) % of women with a live birth in the last 2 years who breastfed their last live-born child at any time	95.2	Acceptable
Early initiation of breastfeeding (N=1152) % of women with a live birth in the last 2 years who put their last new-born to the breast within one hour of birth	77.3	Alert
Exclusive breastfeeding under 6 months (N=566) % of infants under 6 months of age who are exclusively breastfed	82.7	Alert
Continued breastfeeding (N=1152) % of children 0-23 months still receiving breast milk by the time of the survey	91.2	Acceptable
Introduction of solid, semi-solid or soft foods (N=57) % of infants' age 6-8 months who received solid, semi-solid or soft foods during the previous day.	58.0	Alert
Minimum meal frequency (N=607) % of children age 6-23 months who received solid, semi-solid and soft foods (plus milk feeds for non-breastfed children) the minimum number of times during the previous day.	52.6	Alert
Minimum dietary diversity (N=606) % of children age 6–23 months who received foods from 4 or more food groups during the previous day.	14.0	Critical
Minimum acceptable diet (N=606) % of breastfed children age 6–23 months who had at least the minimum dietary diversity and the minimum meal frequency	7.8	Critical
Bottle feeding (N=966) % of children age 0-23 months who were fed with a bottle during the previous day	4.5	Alert

Initiation of Breastfeeding

Breastfeeding was almost universally (95.2%) practiced among the interviewed mothers for children 0-23 months of age, with 81.1% of them initiating it within one hour of child's birth as recommended.

Exclusive Breastfeeding

Exclusive breastfeeding means that the infant receives breast milk (including expressed breast milk or breast milk from a wet nurse – a caregiver who is not the biological mother of the child) and allows the infant to receive ORS, drops, syrups (vitamins, minerals, medicines), but nothing else.

The World Health Organization (WHO) recommends that infants should be exclusively breastfed from birth to 6 months of age (180 days). Breast milk provides all the energy and nutrients needed for healthy growth. It contains anti-infective substances which protect the child from diarrhea and other illnesses. Tiwalere II project plans to "Increase the proportion of children 0-5months who are exclusively breastfed by 14%".

As shown in **Table 9** below, the majority of the mothers (82.7%) practiced exclusive breastfeeding of infants under 6 months of age (N=566). Karonga and Chitipa recorded acceptable levels of exclusive breastfeeding of at least 90%, while Nkhotakota registered the lowest percentage at 69.0%. Analysis of anthropometric data also showed that the same district had the highest levels of all forms of undernutrition. The table below shows the proportion of mothers practicing exclusive breastfeeding in the surveyed districts.

Among those who did not practice exclusive breastfeeding, 17.3% introduced complementary foods before infants reached 6 months of age and 3.5% gave them pre-lacteal foods such as watery porridge (*mzuwa*/*dawale*), water and fluids (animal milk and soft drinks) during the first three days after birth. Provision of such foods before the child reached the age of 6 months increased as the child grew up **(Figure 4).**

Table 9: Exclusive breastfeeding of children 0-5 months across Tiwalere II districts

District	Provision of foods and drinks (n)				Exclusive Breastfeeding	
	1st 3 Days	0-5 Months	Total			
	Yes	Yes	n	%	%	Performance
Chitipa **(n=81)**	5	3	8	9.9	90.1	Acceptable
Karonga **(n=93)**	2	4	6	6.5	93.5	Acceptable
Nkhotakota **(n=58)**	3	15	18	31.0	69.0	Alert
Salima **(n=115)**	1	16	17	14.8	85.2	Alert
Mangochi **(n=53)**	2	4	6	11.3	88.7	Alert
Dowa **(n=39)**	2	7	9	23.0	77.0	Alert
Mchinji **(n=73)**	0	20	20	27.4	72.6	Alert
Lilongwe **(n=54)**	5	9	14	26.0	74.0	Alert
Total (N=566)	**20**	**78**	**98**	**17.3**	**82.7**	**Alert**

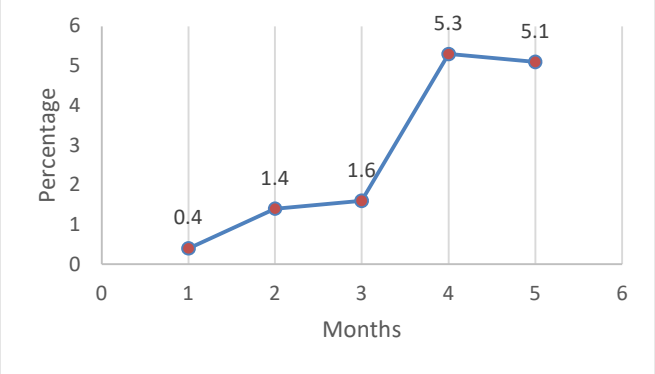


Figure 4: Provision of food before the appropriate age of 6 months (n=98)

"We give infants foods other than breast milk before 6 months of age because of inadequate breast milk after giving birth and in some mother breast milk flows only after 2-3 days of giving birth," said one mother in Salima during the focus group discussion.

Regardless of breastfeeding problems that mothers face, giving complementary foods too soon is dangerous because a child does not need these foods yet, and they may displace breast milk. The risk of diarrhea also increases because complementary foods may not be as clean as breast milk.

Exclusive breastfeeding of infants has been increasing over the years in Malawi. For example, in a survey by UNICEF (2000) in its programme areas throughout the country, the proportion of infants exclusively breastfed was 24.6%; a follow up survey by the same organization in 2004 found that exclusive breastfeeding had increased to 50.0%. The MDHS of 2010 recorded exclusive breastfeeding at 71.9% for infants under six months of age. The nationwide percentages of exclusive breastfeeding reported by the MDHS of 2015/2016 is 61% and Global Nutrition Report in 2014 found an average of 71%.

Timely Complementary Feeding

Complementary foods should be started at 6 months of age because the baby can no longer get enough energy and nutrients from breast milk alone. At this age, the mouth develops sufficiently to let the baby chew and the digestive system is mature enough to digest a range of foods.

In this survey, slightly above one third (37.4%) of the mothers reportedly practiced timely introduction of solid, semi-solid and liquid food – considered as the provision of such foods when infants were 6-8 months of age **(Figure 5)**.

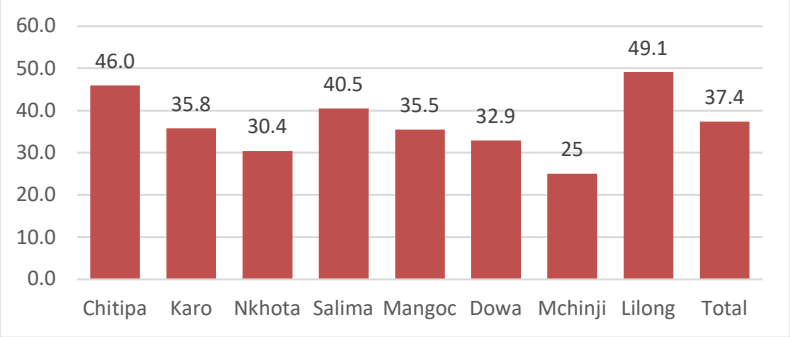


Figure 5: Proportion of mothers who practiced timely **c**omplementary feeding (%)

Starting complementary feeding too early is undesirable as already mentioned. Starting complementary feeding too late is also dangerous because a child does not get the extra food needed to fill the energy and nutrient gaps. As a consequence, she stops growing or grows slowly and the risk of malnutrition and micronutrient deficiencies increases.

Continued Breastfeeding

Breast milk is an important source of energy and children aged 6-23 months. It can provide half or more of a child's energy needs between the ages of 6 and 12 months, and one third of energy needs between 12 and 24 months.

Babies should continue to be breastfed for up to 2 years of age or beyond. When provided along with appropriate and adequate complementary food, breast milk continues to be an important source of nutrition and fluids and immunological protection for the child after 6 months of age. The continued bonding between mother and child provided by breastfeeding encourages optimal psychosocial development.

To assess the proportion of mothers still breastfeeding infants the survey asked the following question: "Are you still breastfeeding the child?" **Table 10** presents the results obtained.

Table10: Continued breastfeeding at 12-15 months

District	Frequency	Are you still breastfeeding [name of child]?		Total
		No	Yes	
Chitipa	Count	4	21	25
	%	16.0%	84.0%	100%
Karonga	Count	0	7	7
	%	0.0%	100.0%	100%
Nkhotakota	Count	0	18	18
	%	0.0%	100.0%	100%
Salima	Count	0	23	23
	%	0.0%	100.0%	100%
Mangochi	Count	1	9	10
	%	10.0%	90.0%	100%
Dowa	Count	0	11	11
	%	0.0%	100.0%	100%
Mchinji	Count	0	23	23
	%	0.0%	100.0%	100%
Lilongwe	Count	1	15	16
	%	6.2%	93.8%	100%
Total	Count	6	127	133
	%	4.5%	95.5%	100%

Cross tabulations of the relevant breastfeeding indicators showed that 95.5% of mothers were still breastfeeding their children at 1 year (12-15 months) across the districts, meaning that only 4.5% of the children had stopped.

More so, **Table 11** below shows that 91.4% of the mothers with children in the age group of 20-23.9 months (N=105) continued to breastfeed them in all the districts surveyed.

Table 11: Continued breastfeeding at 2 years (20-23.9 months)

District	Frequency	Are you still breastfeeding [name of child]?		Total
		No	Yes	
Chitipa	Count	1	13	14
	%	7.1%	92.9%	100%
Karonga	Count	3	21	24
	%	12.5%	87.5%	100%
Nkhotakota	Count	0	9	9
	%	0.0%	100.0%	100%
Salima	Count	3	13	16
	%	18.8%	81.2%	100%
Mangochi	Count	1	9	10
	%	10.0%	90.0%	100%
Dowa	Count	0	8	8
	%	0.0%	100.0%	100%
Mchinji	Count	0	12	12
	%	0.0%	100.0%	100%
Lilongwe	Count	1	11	12
	%	8.3%	91.7%	100%
Total	Count	9	96	105
	%	8.6%	91.4%	100%

Reasons for Stopping Breastfeeding

The reasons for discontinuing breastfeeding included the feelings of discomfort because of the onset of pregnancy, sickness of the mother, children refusing to suck because of sickness or mere loss of appetite.

Minimum Meal Frequency

Minimum meal frequency is defined as the percentage of children age 6-23 months who received solid, semi-solid and soft foods (plus milk feeds for non-breastfed children) the minimum number of times (at least 3 times) on the day preceding the interview.

In Malawi, the typical traditional complementary feeding consists of three meals per day - breakfast, lunch and supper- and children ought to eat a variety of snacks between meals to increase the intake of macro and micronutrients.

On the day prior to the survey, half of the 6-23 month-children surveyed (52.6%) consumed at least 3 meals on the day preceding the survey.

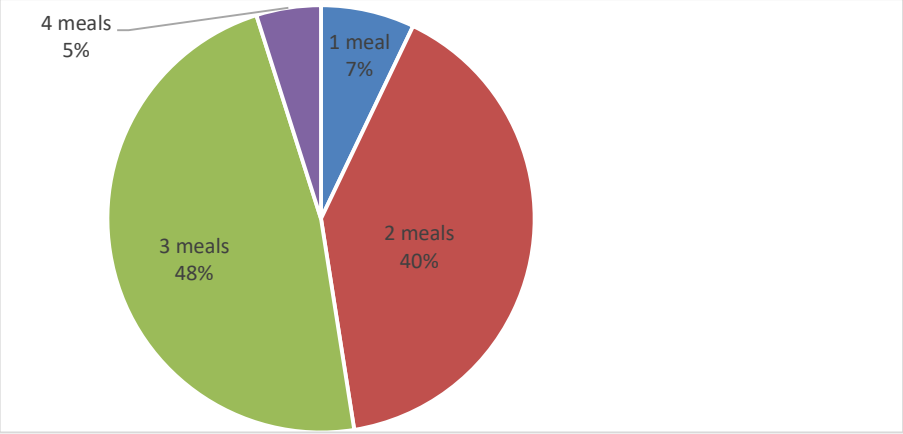


Figure 6: Number of meals consumed by children 6-23 months (N=607)

Minimum Diet Diversity

The survey also measured minimum dietary diversity to determine the proportion of children 6-23 months of age who received foods from 4 or more groups on the day before the survey. Seven food groups were used in the study's questionnaire, namely grains, roots and tubers; legumes and nuts; dairy products; flesh foods (meat, fish, poultry and liver/organ meats); eggs; vitamin-A rich fruits and vegetables and other fruits and vegetables.

In general, minimum dietary diversity of children 6-23 months was found to be worse or critical at 14.0%. In other words, only 14 in every 100 children of this age had adequate diets and a high likelihood of consuming at least one animal-source food and one fruit or vegetable in addition to staples (grain, roots and tubers). Children's diets were somehow better in Nkhotakota (26.7%), Mchinji (24.4%) and Salima (18.3%) compared to the other districts.

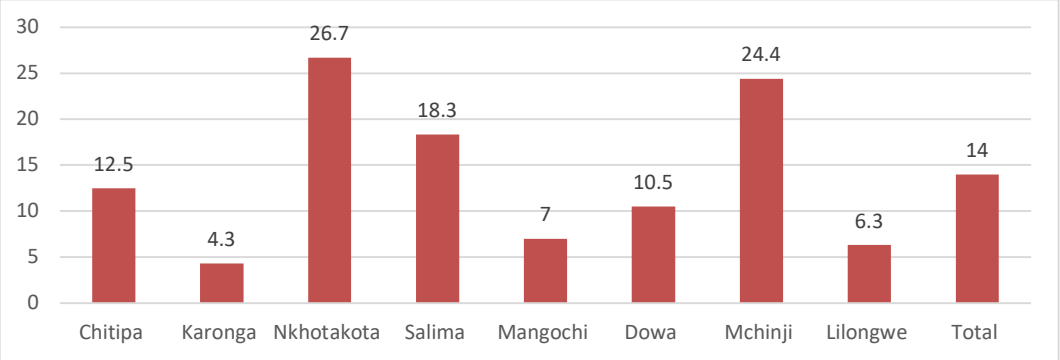


Figure 7: Proportion of children 6-23 months who received minimum dietary diversity (N=606)

Minimum Acceptable Diet

Minimum acceptable diet was measured as the % of breastfed children aged 6–23 months who had at least the minimum dietary diversity and the minimum meal frequency. Cross tabulations of these indicators showed that 7.8% of the aforesaid group of children (N=606) received minimum acceptable diet across the districts. By implication, these are the only children who ate at least three times on the day preceding the interview and the meals were well diversified. Put differently, while 52.6% of the children 6-23 months consumed at least three meals the previous day before the survey as mentioned above, their diets were too poor to offer the required diversity of food groups.

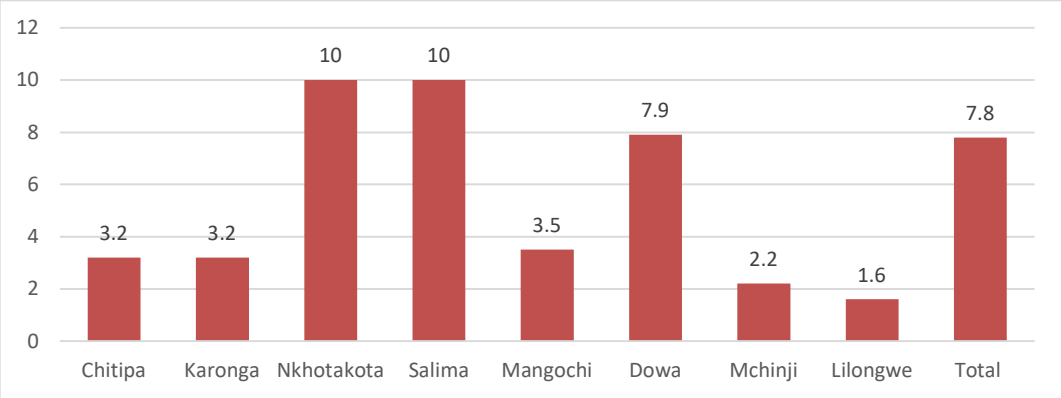


Figure 8: Proportion of children 6-23 months who received minimum acceptable diet (N=606)

The MDHS survey of 2015/2016 reported minimum acceptable diet of 7.5 in children of this age, suggesting the need for huge improvements in the vast majority of the districts in the country.

Sub-IR 1.1.2: Increasing the consumption of foods rich in micronutrients and protein by PLW

Women Dietary Diversity Score (WDDS)

The survey measured individual dietary diversity scores of women and adolescent girls (15-19 years) using a 24 hour dietary recall.

A set of 12 food groups as suggested by the U.N. Food and Agriculture Organization (FAO) and the USAID-funded Food and Nutrition Technical Assistance Project (FANTA) was used in the questionnaire and aggregated to nine groups during analysis.

Women Dietary Diversity Score (WDDS) reflects the probability of micronutrient adequacy of the diet and therefore food groups included in the score are tailored towards this purpose.

Fats and oils, sweets and spices and condiments do not contribute to the nutrient density of the diet and are not part of the WDDS.

Results from cross tabulations of the data obtained showed that half of the women (51.8%) and slightly above two thirds of the adolescents (69.4%) consumed a minimum of four food groups the previous day or night. By implication, these were the women and adolescent girls who were more likely to consume adequate diets with higher (more adequate) micronutrient intakes than their counterparts who did not achieve the minimum dietary diversity.

Table 12: Proportion of women who consumed at least 4 food groups on the day prior to the interviews (N=1737)

District	Mother Category			Total
	0-5 months	6 – 23 months	24 – 59 months	
Chitipa	51.9	60.0	51.6	54.6
Karonga	47.3	50.0	40.0	45.7
Nkhotakota	50.0	71.9	85.7	69.0
Salima	47.4	40.5	71.1	53.1
Mangochi	43.4	27.8	35.8	35.6
Dowa	38.5	37.8	71.1	49.1
Mchinji	53.4	53.2	84.4	63.8
Lilongwe	40.7	39.7	35.6	38.6
Total	**47.4**	**48.5**	**59.3**	**51.8**

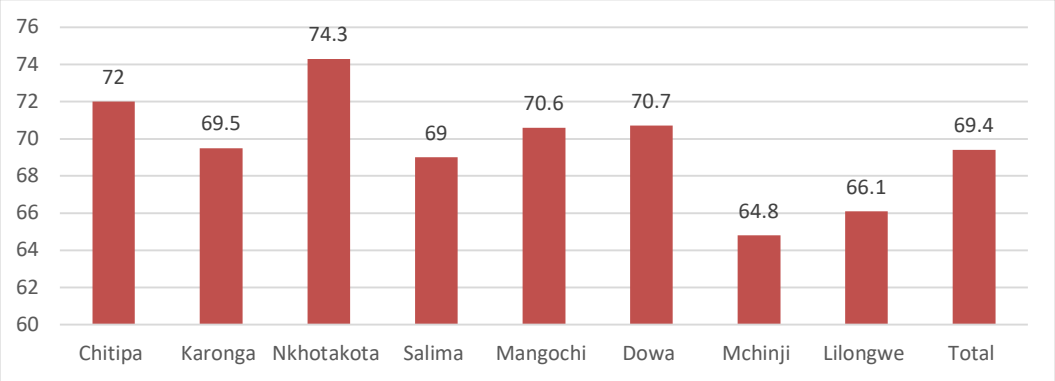


Figure 9: Proportion of adolescent girls who consumed at least 4 food groups on the day before the interview (N=1481)

Meal Patterns

The survey found that most of the food eaten by women were cereals; vegetables; fruits and legumes. Very few women, girls and children had access to tubers, meats, eggs as well as milk and milk products (**Figure 10**) due to scarcity and expensiveness of these commodities on the market. Tiwalere II has already included small scale livestock farming (SSLF) as one of the interventions to increase consumption of meat and meat products in the districts.

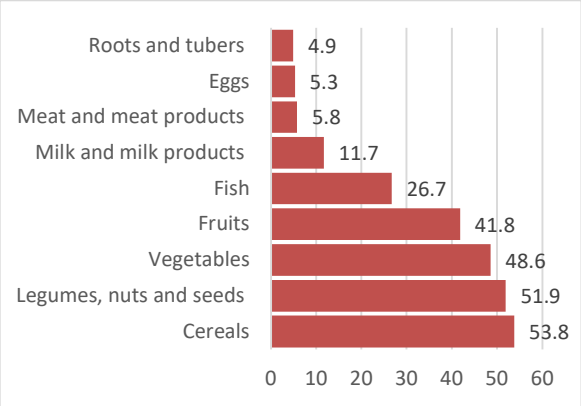


Figure 10: Proportion of mothers who ate specific food groups on the day before the survey

IR 1.2 Coverage of key health and nutrition services for children under 5 and pregnant women improved (i.e. Vitamin A Supplementation, deworming, screening/referral for acute malnutrition, family planning and ANC).

Percentage of pregnant women who attended ANC during the first trimester

Antenatal care (ANC) can help prevent pregnancy complications and inform women about important steps they can take to protect their infant and ensure healthy outcomes. Antenatal care from skilled health providers is important for proper monitoring of the pregnancy and to reduce morbidity and mortality risks for the mother and child during pregnancy, delivery and the postnatal period (e.g. within 42 days after delivery).

Antenatal visits in the first trimester are specifically important as this is the time when pregnant women undergo physical examination, lab tests and skilled health practitioners discuss women past experiences and issues of lifestyle that would have an impact on the health of the pregnancy.

Descriptive results from **Table 13** below show that 43.9% of women of reproductive age (15-49 years) in the 8 districts (N=1701) had their first antenatal visit in the first trimester during their last pregnancy.

Table 13: ANC Attendance by the pregnant women

Indicator	Description	%
ANC attendance during the first trimester	Percentage of women aged 15-49 years with a live birth during their last pregnancy who attended ANC in the first trimester	43.9
Antenatal care coverage	Percentage of women aged 15-49 years with a live birth during their last pregnancy who were attended:	
	▪ at least once by skilled health personnel	100
	▪ at least four times by any provider	0
Skilled attendant at delivery / Institutional deliveries	Percentage of women aged 15-49 years with a live birth who were attended by skilled health workers (doctor, nurse or mid-wife) during their most recent live birth	98.6

This survey engaged a total of 1701 women of reproductive age (15-49 years) and found that 43.9% of them attended ANCs during the first trimester of their last pregnancy.

Individual district's performance ranged from 30.4% in Nkhotakota to 55.6% in Mangochi **(Table 14)**. Nkhotakota recorded the lowest coverage at 30.4% followed by Mchinji (30.6%). Extra efforts are needed to change mothers' behaviors and accelerate coverage in these districts.

Table 14: ANC visits during the first trimester disaggregated by mother category

District	Mother Category			Total
	0-5 months	6 – 23 months	24 – 59 months	
Chitipa	35.8	37.9	47.4	41.3
Karonga	51.6	51.1	55.8	52.8
Nkhotakota	39.7	36.8	14.3	30.4
Salima	51.3	55.4	28.1	44.9
Mangochi	49.1	74.1	43.4	55.6
Dowa	53.8	54.1	28.9	45.6
Mchinji	31.5	40.5	19.5	30.6
Lilongwe	55.6	44.8	52.5	50.9
Total	**45.8**	**49.0**	**37.1**	**43.9**

The majority of the mothers visited health facilities for antenatal care four times (41.7%) during their last pregnancy **(Figure 11)** and slightly more than one third of them (38.7%; n=665, N=1717) were escorted by their husbands at some point. **Figure 12** shows that the majority of the husbands escorted their wives to ANCs twice during the last pregnancy. Very few husbands made 4 or 5 escorts based on the results obtained.

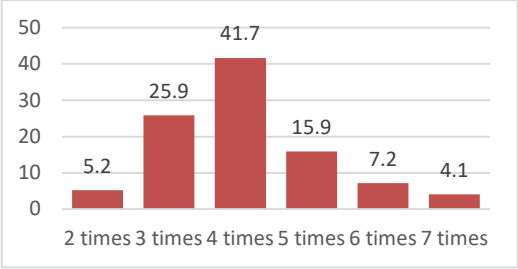


Figure 11: Number of ANC visits by the mother during the last pregnancy

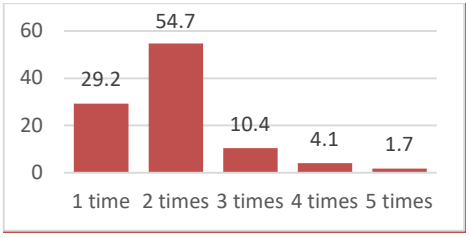


Figure 12: Number of escorts to ANCs by husbands

Percentage of deliveries conducted by skilled health workers

All women interviewed in this survey reported that they were assisted by skilled health workers (doctor, nurse or mid-wife) when they sought antenatal care. The proportion of women aged 15-49 years with a live birth whose most recent live birth was delivered in a health facility (e.g. institutional deliveries) by qualified health professionals was also found to be very high at 98.6 per cent (N=1701). In total, 24 of the 1701 women interviewed (1.3%) delivered at home with the assistance of traditional birth attendants and elderly women such as grandmothers and mother-in-laws.

Table 15: Deliveries by health professionals by mother category and district (%)

District	Mother Category			Total
	0-5 months	6-23 months	24-59 months	0-59 months
Chitipa	97.5	93.7	97.9	96.3
Karonga	100.0	100.0	100.0	100.0
Nkhotakota	100.0	100.0	98.2	99.4
Salima	99.1	100.0	100.0	99.7
Mangochi	98.1	96.3	96.2	96.9
Dowa	100.0	100.0	100.0	100.0
Mchinji	100.0	100.0	100.0	100.0
Lilongwe	92.6	98.3	96.6	95.9
Total	**98.6**	**98.5**	**98.8**	**98.6**

Sub-IR 1.2.1: Improving access to and usage of key nutrition services

5.9 Child Micronutrient Supplementation

Every six months, the government of Malawi and its development partners, in particular the United Nations Children's Fund (UNICEF), run 'child health week' campaigns for vitamin A supplementation and de-worming of children. Malnourished children are assured of quick recuperation and good nutrition when these preventive health interventions are provided.

Vitamin A Supplementation

Vitamin A supplementation is one of the key requirements for children under 5. Vitamin A is critical among others for good vision, healthy bone growth, cell division and growth and support immune system.

Tiwalere project aims at increasing the percentage of children that receive Vitamin A supplementation by 8% in the project life.

In total, 90.6% of the children 6-59 months of age received a capsule of vitamin A over the past 6 months according to observations in the health passports and mothers' recall. **Table 16** disaggregates results of child vitamin A supplementation by district.

Table 16: Vitamin A supplementation of children (N=1739)

Answer	District								Total
	Chitipa (n=271)	Karonga (n=282)	Nkhotakota (n=171)	Salima (n=341)	Mangochi (n=160)	Dowa (n=114)	Mchinji (n=229)	Lilongwe (n=171)	
No	15.5	9.6	12.9	5.9	15.6	4.4	7.9	1.8	9.3
Yes (Health Passport)	53.5	72.3	67.8	79.5	66.9	84.2	79.0	80.1	72.3
Yes (Recall)	30.6	18.1	19.3	14.7	17.5	11.4	13.1	18.1	18.3
Yes (Total)	**84.1**	**90.4**	**87.1**	**94.2**	**84.4**	**95.6**	**92.1**	**98.2**	**90.6**
Do not Remember	.4	.0	.0	.0	.0	.0	.0	.0	.1

Based on the data presented in **Table 16,** Vitamin A supplementation was lower in Chitipa and Mangochi at 84% and highest in Lilongwe at 98.2% followed by Dowa (95.6%), arguably attributed to availability of the supplement.

An average of 90.6% found in this survey is relatively high when compared to figures reported in other studies. For example, the Nutrition SMART Survey of 2016 conducted by UNICEF found that seven in every ten children (71.3%) were supplemented with Vitamin A; with Shire Highlands registering the highest coverage (77.2%) and the least coverage was recorded in Lake Chirwa Phalombe Plain (65.8%).

Growth Monitoring

Growth monitoring and promotion (GMP) is an operational strategy of enabling mothers and caretakers to visualize growth or lack of growth, and to receive specific, relevant and practical guidance in ways which the household and community can act to ensure health and continued growth of the child.

The Ministry of Health in Malawi requires that GMP be done monthly and links GMP visits to treatment for malnutrition to ensure all children have adequate health and nutrition.

To assess growth monitoring progress of the children, the survey asked two questions 1) *Was the child weighed at birth*? and 2) *When was the child last taken for weighing*?

Low-birth weight

Analysis of descriptive data obtained showed that an overwhelming majority of the children (n=1690; 97.2%) were weighed at birth based on the observations on the health passports (n=1679) and mothers' recalls (n=11). **Table 17** shows details of low birth weight[3] recorded in the study.

Table 17: Low-birth Weight

Indicator	n	%
Infants weighed at birth (N=1739)	1690	97.2
Low-birth weight infants e.g. below 2,500 grams at birth (N=1716)	83	4.8

In total, 4.8% of the children under five years of age were born already underweight. LWB is either caused by preterm birth (that is, a low gestational age at birth, commonly defined as younger than 37 weeks of gestation or a slow prenatal growth rate, or a combination of both).

[3] Low birth weight (LBW) is defined by the World Health Organization as a birth weight of a live born infant of 2,499g or less, regardless of gestational age. Subcategories include very low birth weight (VLBW), which is less than 1500g and extreme low birth weight (ELBW), which is less than 1000g. Normal weight at delivery is 2500-4200g.

In general, risk factors in the mother that may contribute to low birth weight include young ages, multiple pregnancies, previous LBW infants, poor nutrition and insufficient prenatal care.

GMP after Birth

According to observations in health passports, mothers' recalls and descriptive analysis of the survey data, slightly more than one quarter (76.1%) of the children were weighed in the past month. Dowa, Lilongwe and Karonga were the districts with higher attendance to GMP sessions than the other districts, with the lowest coverage found in Mchinji (61.1%).

Table 18: GMP attendance in the previous month

District	Mother Category			Total
	0-5 Months	6-23 Months	24-59 months	
Chitipa	74.1	73.7	67.4	71.6
Karonga	77.4	78.7	87.4	81.2
Nkhotakota	75.9	75.4	87.5	79.5
Salima	73.9	72.3	91.2	79.2
Mangochi	71.7	74.1	75.5	73.8
Dowa	79.5	81.1	94.7	85.1
Mchinji	46.6	51.9	84.4	61.1
Lilongwe	72.2	87.9	84.7	81.9
Total	**71.2**	**73.4**	**83.6**	**76.1**

Maternal Micronutrient Supplementation

As shown in **Table 19** a large majority of women (93.8%) received iron supplementation and 57.2% took de-worming tablets during the last pregnancy. After child delivery, 86.6% received vitamin A capsules as supplements in the districts surveyed.

Table 19: Maternal Micronutrient Supplementation (N=1739)

Micronutrient Supplementation	Frequency	
	n	%
Iron / folic acid supplementation	1632	93.8
Vitamin A supplementation	1506	86.6
De-worming tablets	995	57.2

Sub-IR 1.2.2 Improved male support for RMNCH

Modern Method Contraceptive Prevalence Rate

Are you currently pregnant?

Only 13 out of the 1739 mothers interviewed were pregnant during the time of the survey in December 2016, giving a 0.7% rate. All of them reported having ITNs and slept under them the last night.

Family Planning

NSO (2015) defines family planning as a conscious effort by a couple to limit or space the number of children they have through the use of contraceptive methods. Contraceptive methods are classified as modern or traditional methods, with modern methods being female sterilization, male sterilization, the intrauterine contraceptive device (IUD), implants, injectable, the pill, male condoms, female condoms, and emergency contraception. Methods such as rhythm, withdrawal, and folk methods are grouped as traditional.

The baseline assessed the extent to which women of reproductive age (15-49 years) were using contraceptives for child spacing and or limit the number of children they can have. In the analysis, if for instance, contraceptive methods of some kind were used by the woman, she got a score of 1 for all of them otherwise a value of zero was given.

In total, close to two thirds of the women (62.2%) were reportedly using some methods of contraceptives to delay and avoid unwanted / unplanned pregnancies across the districts (Table 20). Lilongwe led in the use of contraceptives and Nkhotakota ranked last at 50.3%.

Table 20: Use of modern contraceptives in the districts

District	Mother Category			Total
	0-5 Months	6-23 Months	24-59 months	
Chitipa	69.1	56.8	65.3	63.5
Karonga	71.0	58.5	60.0	63.1
Nkhotakota	69.0	54.4	26.8	50.3
Salima	72.2	82.1	39.5	64.5
Mangochi	66.0	77.8	50.9	65.0
Dowa	74.4	73.0	34.2	60.5
Mchinji	65.8	68.4	29.9	54.6
Lilongwe	74.1	77.6	71.2	74.3
Total	**70.1**	**68.3**	**48.4**	**62.2**

The main contraceptive methods used were injections (reported by 44% of the non-pregnant mothers), pills (25.3%) and implants (16.7) and permanent female sterilization (7%). As shown in **Figure 13** below, the use of traditional contraceptive methods such as abstinence and withdraw were also relatively low, used by one in every 10 people (8.9%).

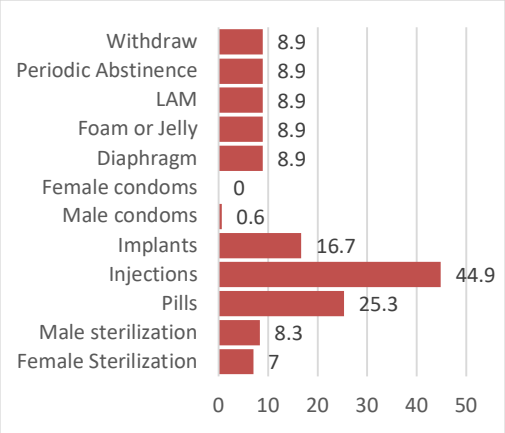


Figure 13: Family planning methods used by the non-pregnant mothers (N=1579)

While free condoms has been a major element of the Malawi's National HIV Prevention Strategy, adoption of the product has remained low on the ground, attributed to the fear of discrimination and chronic shortages of the product, especially for females.

The current survey did not investigate issues of HIV/AIDS and their aggravating factors. Nevertheless, according to the latest statistics by the MDHS of 2015/2016, 890,000 adults of reproductive age (15-49 years), representing a prevalence of 9.1%, are living with the virus in the country. Unprotected heterosexual sex (e.g. failure to use condoms) is the main mode of HIV transmission in the country, accounting for 88 per cent of new HIV infections.

Under Sub-IR 1.2.2 of Tiwalere II project, FEED and its alliance partners are committed to increasing the use of modern contraceptives in the implementation districts through education and awareness about the importance of family planning. Voluntary family planning is an important nutrition-sensitive intervention that is often overlooked in nutrition and food security programming but has been prioritized in the USAID nutrition strategy (USAID 2014). The strategy argues that with short intervals between births mothers may be at risk of undernutrition, resulting in negative changes in maternal weight and body mass index and increased risk of anemia and other micronutrient deficiencies. Poor maternal nutrition leads to poor birth outcomes.

5.6 Maternal Health and Nutrition

In this baseline study, women who had given birth in the 5 years were also asked a number of questions about maternal health besides antenatal care.

Tetanus Prevention

Table 21: Tetanus toxoid immunization schedule for women of childbearing age and pregnant women without previous exposure to TT, Td or DPT

Dose of TT or Td (according to card or history)	When to give	Expected duration or protection
1	At first contact or as early as possible in pregnancy	None
2	At least 4 weeks after TT1 (tetanus toxoid 1)	1-3 years
3	At least 6 months after TT2 or during subsequent pregnancy	At least 5 years
4	At least one year after TT3 or during subsequent pregnancy	At least 10 years
5	At least one year after TT4 or during subsequent pregnancy	For all childbearing age and possibly longer

Worldwide, tetanus kills an estimated 180,000 neonates (about 5% of all neonatal deaths) and up to 30,000 women (about 5% of all maternal deaths) each year.

If the mother is not immunized with the correct number of doses of tetanus toxoid vaccine, neither she nor her newborn infant is protected against tetanus at delivery. Two doses protect for 1-3 years, although some studies indicate even longer protection.

In this survey, observations in maternal health passports showed that 97.8% (N=919) of the women aged 15-49 with a live birth in the last two years received tetanus toxoid. Of these (899 of the 919 mothers), 71.5% received at least two doses of the tetanus toxoid during the last pregnancy while 28.5% got the vaccine once **(Figure 14)**.

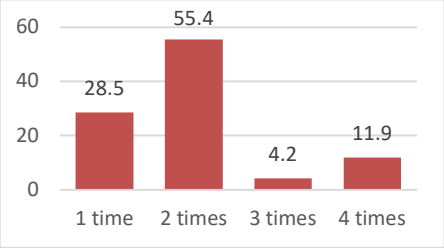


Figure 14: Proportion of mothers who received tetanus toxoid (N=899)

5.8 Intermittent Preventive Treatment

Results from this survey showed that less than half of the mothers (44.7%) received IPTp during the last pregnancy, with the majority (41.6%) having it three times **(Figure 15)**.

Intermittent preventive treatment (IPTp) during pregnancy aim to reduce episodes of maternal malaria, maternal and fetal anemia, placental parasitaemia, low birth weight, and neonatal mortality. The World Health Organization (WHO) recommends that this preventive treatment be given to all pregnant women at each scheduled antenatal care visit starting as early as possible in the second trimester (e.g. not during the first trimester). The world health Organization (WHO) recommends a schedule of four antenatal care visits.

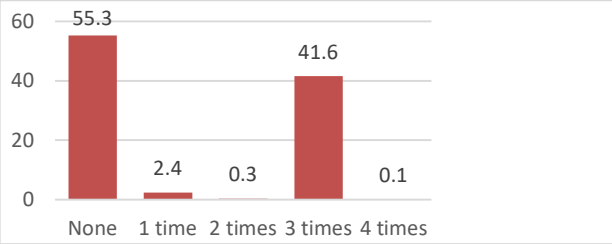


Figure 15: Provision of IPTp to the mothers (N=941)

Escorts to ANCs by Husbands

In this study, the proportion of men who escorted their pregnant wives to ANCs during the most recent pregnancy was found to be 37.2%, higher in Nkhotakota (47.3%) followed by Mangochi (41.0%) and Dowa (40.2%) than the other districts. The proportion of men escorting wives to ANCs was higher for women with children 24-59 months (50.1%) than in the other age categories **(Table 22).** Men with children in this age group were arguably more mature and had been exposed to healthcare education possibly during the previous pregnancies of their wives that made them become committed to attending ANC than did younger men.

Table 22: % of males who accompanied their wives to ANC

District	Mother Category			
	0-5 Months	6-23 Months	24-59 months	Total
Chitipa	38.3	42.1	22.1	33.9
Karonga	26.9	30.9	32.6	30.1
Nkhotakota	35.7	31.6	75.0	47.3
Salima	31.6	16.4	62.8	37.1
Mangochi	45.1	20.8	57.7	41.0
Dowa	26.3	30.6	63.2	40.2
Mchinji	23.3	22.1	71.4	39.2
Lilongwe	40.7	36.2	32.2	36.3
Total	**32.9**	**28.4**	**50.1**	**37.2**

IR 1.3 The identification, prevention, and timely management of key childhood illnesses improved

Percent of children under age five who had diarrhea in the prior two weeks

The study asked mothers and caregivers whether their children had diarrhea within the 2 weeks preceding the data collection exercise. It defined diarrhea as a disease with the following signs: loose stools more than 3 times in 24 hours, sunken eyes and lethargy.

The survey found that 16.2% of the children under 5 years of age had diarrhea in the past two weeks before the date of the interview and the majority (80.4%) of the mothers sought treatment from health facilities.

Table 23: Child retrospective diarrhea in the districts surveyed

District	Frequency	Did the child have diarrhea in the past two weeks?		Total
		No	Yes	
Chitipa	Count	231	37	268
	%	86.2%	13.8%	100%
Karonga	Count	263	19	282
	%	93.3%	6.7%	100%
Nkhotakota	Count	149	22	171
	%	87.1%	12.9%	100%
Salima	Count	293	48	341
	%	85.9%	14.1%	100%
Mangochi	Count	119	41	160
	%	74.4%	25.6%	100%
Dowa	Count	102	11	113
	%	90.3%	9.7%	100%
Mchinji	Count	164	65	229
	%	71.6%	28.4%	100%
Lilongwe	Count	133	38	171
	%	77.8%	22.2%	100%
	Count	1454	281	1735
	%	83.8%	16.2%	100%

Cases of diarrhea were highest in Mchinji (28.4%) followed by Mangochi (25.6%) and Lilongwe (22.2%). Low incidences of diarrhea were found in Karonga (6.7%) and Dowa (9.6%) as shown in **Table 23.**

Care Seeking Behaviors for Diarrhea

Out of the 281 children with diarrhea, 152 visited health centers to seek advice and treatment representing 54.1% attendance rate. **(Table 24)**. Most health care seeking behaviors were reported in Mangochi (68.3%), followed by Lilongwe at 60.5%, Karonga (57.9%), the rest of the districts and then Chitipa at the bottom (35.1%).

Table 24: Proportion of children that sought treatment for diarrhea (N=152)

District	Frequency	Mother Category			Total
		0-5 Months	6-23 Months	24-59 months	
Chitipa	Count	2	4	7	13
	%	25.0	33.3	41.2	35.1
Karonga	Count	8	3	0	11
	%	66.7	42.9	0.0	57.9
Nkhotakota	Count	4	5	2	11
	%	50.0	50.0	50.0	50.0
Salima	Count	11	11	3	25
	%	52.4	52.4	50.0	52.1
Mangochi	Count	12	8	8	28
	%	70.6	66.7	66.7	68.3
Dowa	Count	3	2	1	6
	%	60.0	50.0	50.0	54.5
Mchinji	Count	12	15	8	35
	%	44.4	53.6	80.0	53.8
Lilongwe	Count	5	6	12	23
	%	62.5	50.0	66.7	60.5
	Count	57	54	41	152
Total	**%**	**53.8**	**50.9**	**59.4**	**54.1**

Percentage of children under five years of age with diarrhea in the two weeks preceding the survey who received ORS and/or zinc

According to the available data for mothers who responded to the question about receipt of medication at health facilities (N=145), 72.4% of the children (n=105) received ORS and / or Zinc to be administered at home for the treatment of diarrhea while 52.7% received oral rehydration therapy (ORT) and continued feeding **(Table 25)**.

Table 24 shows that care seeking behaviors for diarrhea were higher in Mangochi, followed by Lilongwe, Karonga, the rest of the districts and finally Chitipa. Nevertheless, the majority of children who went to health facilities and received ORS and/or zinc were from Nkhotakota (100%), Mchinji (97.2%) and Salima (91.7%), Dowa (85.7%) and Chitipa (81.3%).

In Mangochi and Lilongwe, although a large majority of mothers with sick children went to health facilities to seek treatment for diarrhea (**Table 24** above), they were less likely to receive ORS and/or zinc than in the other districts with lower healthcare seeking behaviors as shown in **Table 25**.

Table 25: Children who receive ORS and / or Zinc when they had diarrhea

District	Frequency	Mother Category			
		0-5 Months	6-23 Months	24-59 months	Total
Chitipa	Count	2	4	7	13
	%	50.0	80.0	100.0	81.3
Karonga	Count	8	3	0	11
	%	72.7	50.0	0.0	61.1
Nkhotakota	Count	4	5	2	11
	%	100.0	100.0	100.0	100.0
Salima	Count	8	11	3	22
	%	80.0	100.0	100.0	91.7
Mangochi	Count	1	3	0	4
	%	11.1	60.0	0.0	21.1
Dowa	Count	3	2	1	6
	%	100.0	100.0	50.0	85.7
Mchinji	Count	12	15	8	35
	%	100.0	100.0	88.9	97.2
Lilongwe	Count	1	1	1	3
	%	33.3	25.0	14.3	21.4
Total	**Count**	**39**	**44**	**22**	**105**
	%	**69.6**	**83.0**	**61.1**	**72.4**

Percentage of children under five years with coughs and rapid or difficult breathing taken to health facility

The proportion of children under five years with acute respiratory infections (ARI) – characterized by coughs, colds and fast or shortness of breathing was 48.2% (N=1739). The majority of children in Mangochi (78.1%) and Lilongwe (68.4%) had ARI compared to the other districts as shown in **Table 26.**

Table 26: Proportion of children who had ARI in the districts

District	Frequency	Cough / Cold & Fast Breathing or Shortness of Breath		Total
		No	Yes	
Chitipa	Count	172	99	271
	%	63.5%	36.5%	100.0%
Karonga	Count	116	166	282
	%	41.1%	58.9%	100.0%
Nkhotakota	Count	117	54	171
	%	68.4%	31.6%	100.0%
Salima	Count	177	164	341
	%	51.9%	48.1%	100.0%
Mangochi	Count	35	125	160
	%	21.9%	78.1%	100.0%
Dowa	Count	59	55	114
	%	51.8%	48.2%	100.0%
Mchinji	Count	170	59	229
	%	74.2%	25.8%	100.0%
Lilongwe	Count	54	117	171
	%	31.6%	68.4%	100.0%
Total	**Count**	**900**	**839**	**1739**
	%	**51.8%**	**48.2%**	**100.0%**

When asked whether they went to health facilities to seek advice and treatment for curing ARI, very few mothers (3.8%) said they did not do so. The survey did not investigate the reasons for failure to seek treatment; however it is possible that the mothers were not worried with ARI as they did with diarrhea and malaria.

Table 27: Proportion of children who sought treatment for ARI

District	Mother Category			Total
	0-5 Months	6-23 Months	24-59 months	
Karonga	0.0	0.0	1.6	0.6
Salima	2.9	0.0	0.0	1.2
Mangochi	17.8	4.3	14.7	12.0
Dowa	0.0	0.0	7.7	1.8
Mchinji	0.0	0.0	20.0	3.4
Lilongwe	5.3	8.1	14.3	9.4
Total	**3.9**	**1.7**	**6.3**	**3.8**

5.10 Cases of Malaria in the District

According to the results of this survey, retrospective malaria (considered as children with fever, nausea or vomiting and lack of appetite in the past two weeks prior to the survey) was reported by one third of the mothers (33.4%). An overwhelming majority of the mothers (92.3%) sought treatment for the sick children from the nearest health facilities.

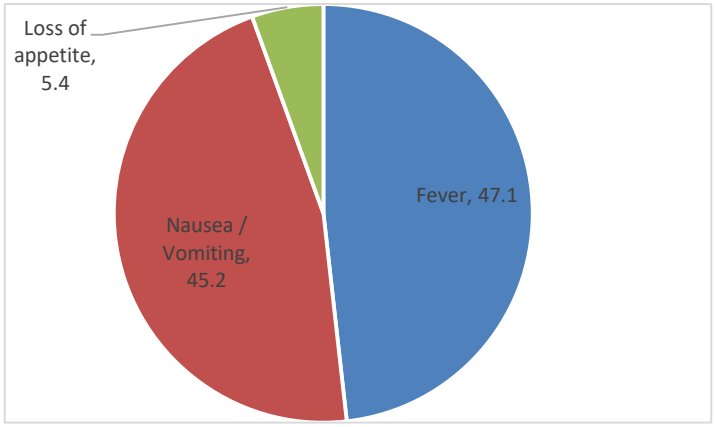


Figure 16: Children with fever, nausea and loss of appetite in the districts (%)

Percentage of children 0-59 months with fever for whom advice/treatment was sought from health facility or provider

Table 28 shows that half of the children (51.3%) who had fever during the aforesaid period sought advise and treatment from qualified health workers, perticularly in Chitipa (100%) and Lilongwe 93.3%). Health seeking behaviours for fever were very low in other districts e.g. Dowa (23.3%) and Nkhotakota (40.7%). Nonattendance to health facility may be due to a variety of local problems such as long walking distances, lack of medical supply at the facilities, negligence on the part of mothers and so forth.

Table 28: Health seeking behaviors for fever

District	Mother Category			
	0-5 Months	6-23 Months	24-59 months	Total
Chitipa	100.0	100.0	100.0	100.0
Karonga	64.7	42.9	100.0	54.8
Nkhotakota	23.5	62.5	100.0	40.7
Salima	31.3	33.3	60.0	34.3
Mangochi	50.0	50.0	50.0	50.0
Dowa	17.6	18.2	100.0	23.3
Mchinji	75.0	71.4	53.3	67.3
Lilongwe	75.0	100.0	100.0	93.3
Total	**44.7**	**50.0**	**70.8**	**51.3**

Percentage of children 12-23 months old, in program catchment area, fully immunized by age one

Full vaccination includes the following: BCG, Polio 3, DPT-HepB-Hib 3, measles, and the recently introduced PCV and ROTA vaccines administered before age 1 in the national immunization schedule.

Since 2002, Malawi has replaced the DPT vaccine with pentavalent vaccine that protects against DPT, hepatitis B (HepB) and *Haemophilus influenza* type B (Hib). In November 2011, the country launched a new vaccine called PCV, which protects children against pneumonia, meningitis, otitis media and bacteraemia. In October 2012, Malawi officially launched the Rotavirus vaccine in the routine national immunization schedule to reduce diarrhea and deaths, especially among children under 1 year of age.

In the routing immunization schedule, BCG and polio vaccines should be given within the first 14 days after birth, and the DPT-HepB-Hib, PCV and polio vaccines should be given at approximately 6, 10 and 14 weeks of age. The measles vaccine should be given when, or soon after, the child reaches 9 months of age. It is recommended that children receive the complete schedule of vaccination before their first birthday.

Table 29: Results for child immunization for the eight districts surveyed

Indicator	Description	%
Health passport	% of Children who have Health passport a) No Health passport b) Yes seen Health passport c) Yes, but not seen Health passport	 4.5 82.6 12.9
Tuberculosis immunization (N=379)	Percentage of children age 12-23 months who received immunization coverage BCG vaccine by their first birthday	94.5
Polio immunization coverage (N=380)	Percentage of children age 12-23 months who received the third dose of OPV vaccine (OPV3) by their first birthday	86.6
Diphtheria, pertussis and tetanus (DPT), Hepatitis, influenzae type B (Hib) immunization coverage (N=380)	Percentage of children age 12-23 months who received the third dose of DPT-HepB-Hib 3 by their first birthday.	87.4
Measles immunization coverage (N=380)	Percentage of children age 12-23 months who received measles vaccine by their first birthday	72.9
PCV immunization coverage (N=380)	Percentage of children age 12-23 months who received the third dose of PCV vaccine (PCV3) by their first birthday	83.4
Full immunization coverage 1 (N = 380)	Percentage of children age 12-23 months who received all vaccinations recommended in the national schedule by their first birthday (excluding recently introduced ROTA and PCV)	64.7
Full immunization coverage 2 (N = 380)	Percentage of children age 12-23 months who received all vaccinations recommended in the national immunization schedule by their first birthday (including recently introduced ROTA and PCV)	51.1

In this survey, observations in children's health cards and cross tabulations of the data obtained showed the percentage of children who received full immunizations, including recently introduced ROTA and PCV, by 12 months was 51.1%. Figure 17 shows specific vaccinations received by the children aged 12-23 months.

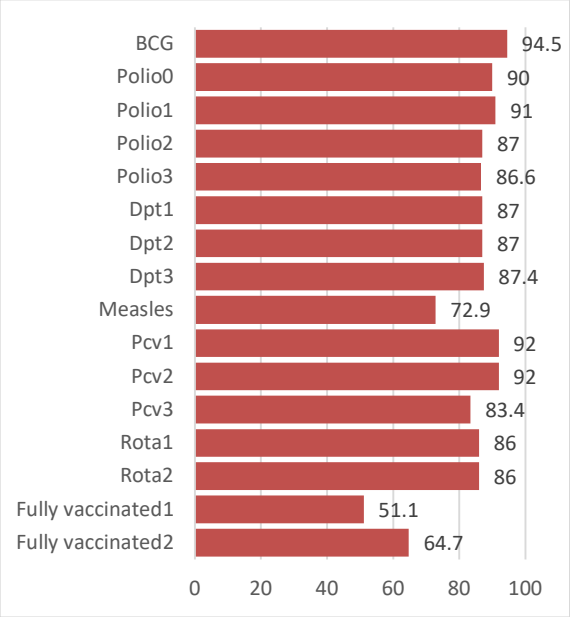


Figure 17: Vaccinations by 12 months

Percentage of pregnant women/ mothers of children 0-23m who slept under an ITN the previous night

In total, 1154 of the 1172 of the pregnant women and mothers of children 0-23months (e.g. 98.5%; N=1172) had ITNs nets and all of them reportedly slept under them the previous night to avoid contracting malaria caused by female anopheles mosquitoes. **Table 30** shows the actual number of mothers that slept under ITNs disaggregated by district and the mothers' category.

Table 30: Number of mothers with ITNs and that slept under them the previous night.

District	Mother Category			Total
	0-5 Months	6-23 Months	24-59 months	
Chitipa	73	90	11	174
Karonga	88	91	4	183
Nkhotakota	57	56	5	118
Salima	112	112	13	237
Mangochi	45	48	8	101
Dowa	39	35	1	75
Mchinji	73	74	5	152
Lilongwe	52	53	9	114
Total	**539**	**559**	**56**	**1154**

Percentage of children 0-23 months who slept under an ITN the previous night

This baseline study assessed the percentage of women and their infants who had insecticide treated mosquito nets (ITN) that were being used every night including the night before the survey. The table below shows results obtained.

Table 31: Utilization of mosquito nets on the night before the date of the survey

District	% with Mosquito Nets	% Using the Nets	% that Used the Nets Last Night	Type of Mosquito Nets - LLIN
Chitipa	100	100	100	100
Karonga	100	100	100	100
Nkhotakota	100	100	100	100
Salima	99	99	99	99
Mangochi	90	90	90	90
Dowa	100	100	100	100
Mchinji	100	100	100	100
Lilongwe	94	94	94	94
Total	**98**	**98**	**98**	**98**

Table 31 above shows that ninety-eight percent of the households across the districts had Long-Lasting Insecticidal Nets (LLIN) that were functional and were used the previous night before the survey team visited them. The high percentages of ownership and utilization of mosquito nets can be attributed to the government and other stakeholders in health sector that have been distributing mosquito nets during malaria campaigns.

An ITN net is (1) a factory-treated net that does not require any further treatment or (2) a net that has been soaked with insecticide within the past 12 months. LLIN nets are a subset of ITNs. Thus, an LLIN net is a factory-treated mosquito net made with netting material that has insecticide incorporated within or bound around the fibers.

IR 1.4. The health and nutrition status of adolescent girls (15-19 years old) improved

Percentage of female teen group members who report consumption of iron-rich food in the past 24 hour

Animal foods rich in iron include red meats, organ meats, fish and poultry. Plant sources are beans, dark green leafy vegetables and dried fruits. Iron deficiency in developing countries is due to inability to consume animal sources of iron.

On the day preceding the survey, consumption of iron rich foods was also relatively low across the districts, reported by slightly more than one third of the adolescent girls (36.1%). This result confirms that the majority of households from which these adolescents were coming from had hardship accessing meat and meat products.

In some settings, adolescent girls may be disadvantaged in intra-household distribution of foods from animal sources due to cultural obligations that tend to favor men or because of regular absence at home while attending school far away.

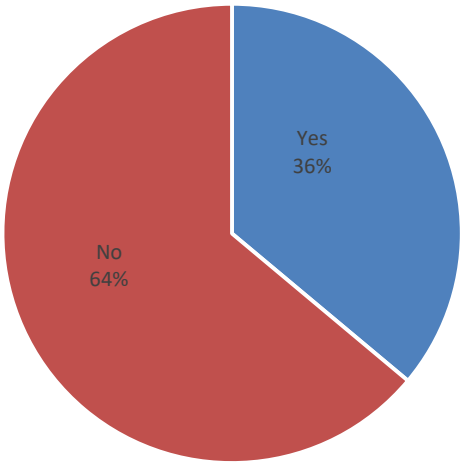


Figure 18: Consumption of vitamin and iron rich foods by adolescent girls (%)

KRA 2: INCREASED AVAILABILITY AND ACCESS TO FOODS RICH IN MICRONUTRIENTS & PROTEIN AMONG 298,608 HOUSEHOLDS WITH PREGNANT WOMEN AND CHILDREN UNDER FIVE (5) YEARS OF AGE BY JUNE 2021

Average Household Dietary Diversity score

Besides women and adolescent girls, the study assessed the number of food categories consumed by the sampled households as a measure for food diversity. It asked the following question to the respondents: "Please describe the foods (meals and snacks) that the members of your household ate or drank yesterday during the day and night at home. Start with the first food or drink of the morning."

In the questionnaire, various foods under the following groups were given as possible options: cereals, roots and tubers, vegetables, fruits, meat, fish and sea food, legumes, milk and milk products, oils and fats, sweets, spices and eggs.

On average, the households surveyed across the districts consumed a diversified diet composed of at least six food groups (μ=6.15) as shown in Table 32, confirming that most of the available foods were not eaten by women and adolescent girls but other members of the households.

Table 32: Average dietary diversity score across the districts

District	Frequency	Mother Category						Total	
		0-5 months		6-23 months		24-59 months			
		# of HHs	Total # of Food Groups	# of HHs	Total # of Food Groups	# of HHs	Total # of Food Groups	# of HHs	Total # of Food Groups
Chitipa	Total	81	504	95	592	95	574	271	1670
	Mean		6.2		6.2		6.0		6.2
Karonga	Total	93	562	94	589	95	581	282	1732
	Mean		6.0		6.3		6.1		6.1
Nkhotakota	Total	58	363	57	362	56	411	171	1076
	Mean		6.3		6.4		7.3		6.3
Salima	Total	115	692	112	647	114	795	341	2029
	Mean		6.02		5.78		6.97		5.95
Mangochi	Total	53	323	54	303	53	332	160	958
	Mean		6.1		5.6		6.3		6.0
Dowa	Total	39	235	37	223	38	264	114	722
	Mean		6.0		6.0		6.9		6.3
Mchinji	Total	73	460	79	495	77	564	229	1519
	Mean		6.3		6.3		7.3		6.6
Lilongwe	Total	54	315	58	342	59	309	171	996
	Mean		5.8		5.9		5.2		5.8
Total	Total	566	3454	586	3553	587	3830	1739	10702
	Mean		6.10		6.06		6.52		6.15

Foods eaten by most of the households were cereals (100%), vegetables (100%), fruits (72%), legumes (52%) and Oils and Fats (37%). There were few households that had meat (2%) and milk and milk products which averaged (12%) across the districts. Roots and tubers were completely not available to these households that can be attributed to the seasonality problem.

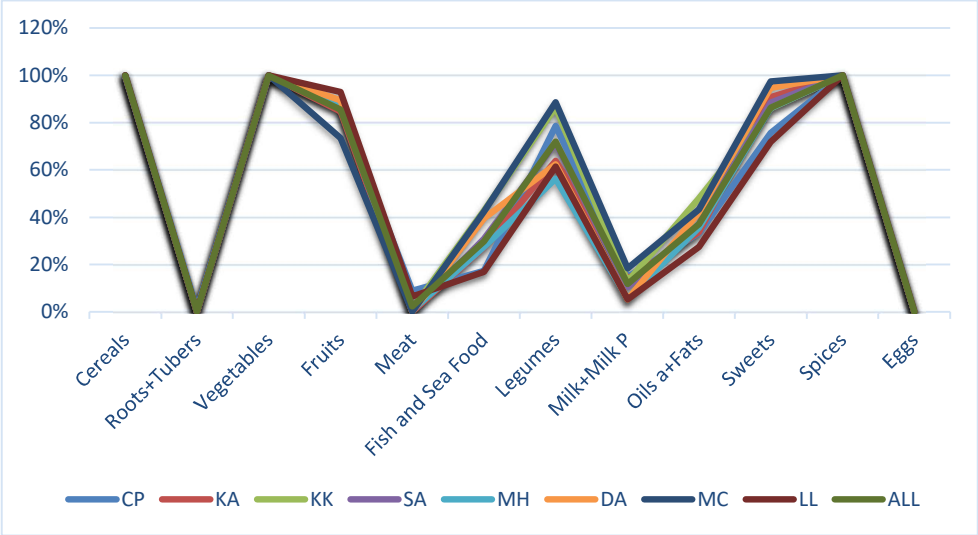


Figure 19: Dietary diversity for the Household
Note: In this figure, the names of the districts have been abbreviated accordingly

Number of households with gardens producing foods rich in micronutrients and protein

5.12 Backyard Gardens

Backyard or kitchen gardens offer great potential for improving household food security and alleviating micronutrient deficiencies. Gardening can enhance food security in several ways, most importantly through: 1) direct access to a diversity of nutritionally-rich foods, 2) increased purchasing power from savings on food bills and income from sales of garden products, and 3) fall-back food provision during seasonal lean periods.

In this study it was observed that 10.5% mentioned that they have backyard gardens and when these gardens were visited there were no crops. However, some of the crops that respondents mentioned that they grow in these gardens include; mustard, rape, egg plants, and tomatoes.

Table 33: Proportion of respondents with backyard gardens (N=1739)

District	Mother Category			Total
	0-5 Months	6-23 Months	24-59 months	
Chitipa	11.1	12.6	13.7	12.5
Karonga	12.9	6.4	1.1	6.7
Nkhotakota	12.1	15.8	5.4	11.1
Salima	16.5	15.2	5.3	12.3
Mangochi	3.8	9.3	3.8	5.6
Dowa	10.3	10.8	2.6	7.9
Mchinji	17.8	19.0	11.7	3.9
Lilongwe	9.3	10.3	5.1	8.2
Total	**12.5**	**12.6**	**6.5**	**10.5**

Number of households producing small livestock

5.13 Small Scale Livestock Farming (SSLF)

Small scale livestock farming (SSLF) is an important source of the much needed protein in the diet and help to provide improved livelihoods for the majority of rural people. In addition, small livestock can provide many other benefits to smallholder farmers. For example, their manure can benefit other farm enterprise e.g. being used to fertilize crops and fish ponds. By raising livestock and marketing their many products, small scale farmers help to diversify rural diets and sources of income.

Common “small animals” or what are commonly referred to as ‘microlivestock’ are considered to be goats, sheep, pigs, rabbits and poultry.

In cognizance of the aforesaid benefits, Tiwalere II is committed to “Increasing the number of households producing small livestock seven-fold” in the districts it will be operating.

At the moment, small scale livestock farming (SSLF) has remained underdeveloped in Malawi due to a number of factors, including challenges related to marketing and risks such as losses due to theft and predation from wildlife, deaths as a result of diseases, and lack of agricultural extension and veterinary services.

Analysis of livestock data from this study mirrored this trend. For example, slightly more than one third (37.3%) of the 1739 households interviewed in the 8 districts literally had no livestock to raise, representing 636 households altogether. With exception of chickens (44.4%) and goats (25.9%), production of small livestock was very low across the districts.

Table 34: Livestock production levels in Tiwalere II districts

District	Goats	Sheep	Pigs	Chickens	Rabbits	Ducks	Doves
Chitipa	71 26.2%	2 0.7%	65 24.0%	177 65.3%	2 0.7%	5 1.8%	26 9.6%
Karonga	75 26.6%	0 0.0%	21 7.4%	136 48.4%	3 1.1%	29 10.3%	26 9.2%
Nkhotakota	53 31.0%	0 0.0%	14 8.2%	81 47.4%	0 0.0%	29 17.0%	22 12.9%
Salima	79 23.2%	0 0.0%	16 4.7%	113 33.1%	2 0.6%	45 13.2%	33 9.7%
Mangochi	22 13.8%	1 0.6%	2 1.2%	44 27.5%	3 1.9%	4 2.5%	11 6.9%
Dowa	45 39.5%	0 0.0%	10 8.8%	52 45.6%	0 0.0%	27 23.7%	15 13.2%
Mchinji	75 32.8%	0 0.0%	12 5.2%	100 43.7%	0 0.0%	25 10.9%	53 23.1%
Lilongwe	30 17.5%	4 2.3%	14 8.2%	69 40.4%	1 0.6%	1 0.6%	3 1.8%
Total (N=1739)	450 25.9%	7 0.4%	154 8.9%	772 44.4%	11 0.6%	165 9.5%	189 10.7%

The percentage of households with types of livestock of some kind was 62.7% as can be summed up in **Figure 20.**

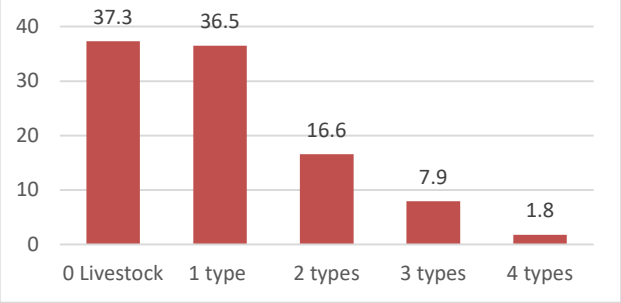


Figure 20: Types of livestock kept by the households interviewed (%)

Number of farmers and others who have applied improved technologies or management practices

5.14 Irrigation farming

Results for irrigation farming is summarized in **Table 35**. The respondents who were not practicing irrigation farming did so citing some of the following reasons: no equipment for irrigation, cost of farming inputs, no *dimba* land, water sources drying up quickly and no water for irrigation. Some of the crops being cultivated under irrigation during the last winter included: maize (80%), common beans (7%), pumpkins (3%), mustard (6%) and onions (1%). In this study, it was observed that respondents were using various types of irrigation, namely treadle pump (5.5%), watering cane (3.9%), and residual soil moisture (0.6%).

Table 35: Proportion of respondents practicing irrigation farming

District	Mother Category		
	0-5 Months	6-23 Months	24-59 months
Chitipa	11.1	11.6	10.5
Karonga	7.5	7.4	4.2
Nkhotakota	6.9	8.8	3.6
Salima	10.4	8.9	2.6
Mangochi	28.3	9.3	20.8
Dowa	5.1	5.4	2.6
Mchinji	20.5	16.5	2.6
Lilongwe	14.8	12.1	15.3
Total	12.7	10.2	7.2

5.15 Rain-fed Crop Production

Cropping Systems Used

Knowledge and practice of different cropping sequences and management technique of particular agriculture field over a period of years is the avenue to improve soil and crop productivity and making a household food secure for a number of years. In this study, the majority of the respondents were practicing mixed cropping (45.7%), followed by mono-cropping 38.8% **(Table 36)**.

Table 36: Cropping being practiced by respondents in the target districts

Cropping systems	Mother Category			Total
	0-5 Months	24-59 months	6-23 Months	
Mono cropping	40.80%	44.50%	31.00%	38.80%
Intercropping	18.20%	15.20%	13.30%	15.50%
Mixed Cropping	41.00%	40.30%	55.70%	45.70%

A 2011 Poverty-Environment Initiative study estimated that if soil erosion would be tackled in Malawi, 1.88 million people could have been lifted out of poverty between, 2005 and 2015. In an effort to determine the best approach to combat soil erosion, the Government of Malawi in collaboration with the UNDP-UNEP Poverty-Environment Initiative carried out a soil loss assessment to update the 1992 soil loss baseline. The study found that the average national soil loss rates in 2014 was 29 ton per hectare per year.

In the present study, we asked respondents to indicate Conservation agriculture (CA) measures they practiced on their farms during the last agricultural season, September 2015 to April 2016, to conserve the water and soil. Conservation agriculture (CA) aims to achieve sustainable and profitable agriculture through the application of the three principles: zero tillage or minimal soil disturbance, mulching and crop rotation. It is a viable way to mitigate effects of climate change and has proven to work in a variety of agro-ecological zones and farming systems.

Descriptive results from the survey showed that more than three quarters of the households were practicing conservation agriculture on their fields across the districts, ranging from 73.1% in Lilongwe to 86% for Dowa **(Table 37)**. There were no major differences in practicing CA technologies among the different mother categories, with exception of the 24-59 months households who recorded the highest percentage for CA at 84.3%. While the majority practiced one or two CA technologies, close to one quarter of the households (21.7%) reportedly were not practicing this type of farming (n=377) on their crop fields due to one reason or the other **(Figure 21)**. Only 4% of the households practiced all the three CA technologies, meaning that there is great need to enhance coverage in all the districts.

Table 37: Proportion of households that practiced CA

District	Mother Category			Total
	0-5 Months	6-23 Months	24-59 months	
Chitipa	77.8	72.6	73.7	74.5
Karonga	77.4	84.0	91.6	84.4
Nkhotakota	75.9	78.9	85.7	80.1
Salima	75.7	74.1	91.2	80.4
Mangochi	69.8	81.5	75.5	75.6
Dowa	79.5	81.1	97.4	86.0
Mchinji	67.1	91.1	83.1	82.9
Lilongwe	63.0	79.3	76.3	73.1
Total	**73.7**	**76.8**	**84.3**	**78.3**

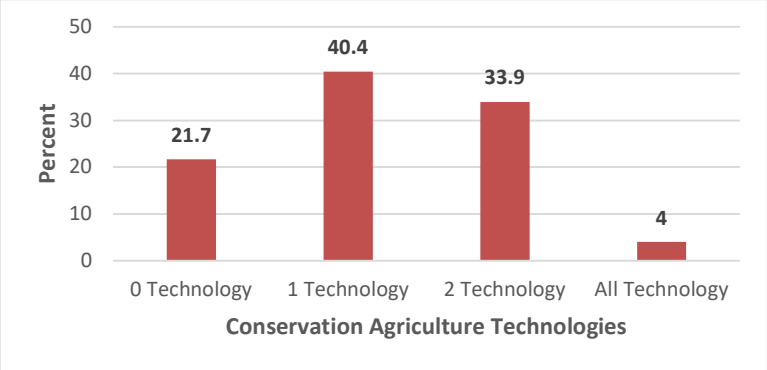


Figure 21: Households practicing conservation agriculture technologies

Number of hectares under improved technologies or management practices

As one of its core indicators of performance, Tiwalere II intends to increase the number of hectares under improved technologies in the targeted districts to achieve its commitment of implementing nutrition-sensitive agriculture interventions.

The baseline study asked respondents to indicate acreages they cultivate and whether they practice CA measures to conserve water and the soils. Analysis of descriptive data obtained showed that the total acreage for the 1739 households was 3493.4, giving an average farm size of 2 acres. Out of the total acreage cultivated, 2729.50 acres of land were subjected to CA (e.g. 1091.8ha) in all the districts and the land that was not under this type of farming was 763.90. **Table 38**, shows total CA acreage cultivated by different categories of households across the districts.

Table 38: Coverage for conservation agriculture in Tiwalere districts

District	Mother Category			Total
	0-5 Months	6-23 Months	24-59 months	
Chitipa	126.25	125.75	120.50	372.50
Karonga	131.00	147.75	156.00	434.75
Nkhotakota	92.50	85.75	129.75	308.00
Salima	160.50	135.00	250.25	545.75
Mangochi	79.00	65.00	86.00	230.00
Dowa	58.00	56.00	86.50	200.50
Mchinji	119.25	123.50	179.00	421.75
Lilongwe	54.00	85.50	76.75	216.25
Total (Acres)	820.50	824.25	1084.75	2729.50
Hectares	328.2	329.7	433.9	1091.8

In general respondents were aware of the three principles of CA, particularly mulching and minimum tillage. For example, when asked about CA most of the focus group discussions (FGDs) and key informants mentioned mulching (*kuyala mapesi* in the local language) and explained what it involves. It is possible that advocates of CA are emphasizing much on these two principles. Focus group discussions and individual interviews with lead farmers revealed that CA reduces crop vulnerability to dry spells, increases yields even in years with lean rainfall and reduces labor requirements (thus making labor available for other livelihood activities).

Conservation Agriculture: Case Study

My name is Marko Bakili from TA Namwera here in Mangochi district. I have been a Lead farmer for quite a long time mainly growing Maize, Soy Bean and Groundnuts. I have been practicing Conservation Agriculture in some of my fields. In the first two years I was given seed and fertilizer to use on my initial CA plot. I have been mulching using crop residues from other field because it is hard to keep the previous year season crop residues for mulching because of termites, mice hunting, and fire attacks among others. This year I am not doing it because the mulch has been destroyed people who hunt mice and it is hard to find the mulch in this area. So the challenge for CA is the burning of crop residues.

The photos to the right show examples of zero tillage and mulching. Advocates of these CA measures advise that "Do not waste time and energy tilling all the land when you only require planting stations. Tilling disturbs decomposition of residues in the soil. Zero tillage helps reduce labor and suppress weeds through ground cover and application of chemicals."

Nevertheless, adoption of these CA measures remain low because of the following reasons: 1) mulching is not conducive in times of heavy rains, 2) the remaining mulch host mice that eat fresh and drying produce, 3) farmers receive contradictory messages from different organizations e.g. the use of mulching versus herbicides to shock weeds.

Compost Manure Making and Utilization

Manure is a valuable fertilizer for any farming operation and has been used for centuries to supply needed nutrients for crop growth. Manure and compost not only supply many nutrients for crop production, including micronutrients, but they are also valuable sources of organic matter. Increasing soil organic matter improves soil structure or tilth, increases the water-holding capacity of coarse-textured sandy soils, improves drainage in fine-textured clay soils, provides a source of slow release nutrients, reduces wind and water erosion, and promotes growth of earthworms and other beneficial soil organisms.

In this study, the majority of respondents were not using any manure in their fields as summarized in Figure 22 below.

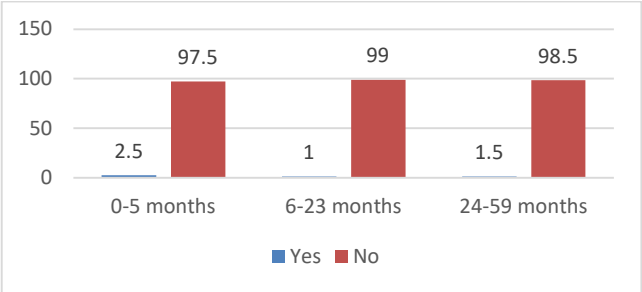


Figure 22: Percentage of respondents who were making compost manure in the targeted districts by mother category

Fertilizer Application

Fertilizer application is the main driver of crop productivity in Malawi. The agriculture sector of Malawi is further characterized by the strong promotion of fertilizer application that is distributed to small-scale farmers, through agro-input dealers within the Farm Inputs Subsidy Programme (FISP). The basis for these policies is that they result in increased production and thereby contribute to national food security.

In this study respondents indicated they apply either fertilizer or both fertilizer and manure in their fields to improve crop productivity as shown in **Table 39**.

Table 39: Proportion of respondents using fertilizer or both manure and fertilizer

Application of Fertilizer	Mother Category			Total
	0-5 Months	24-59 months	6-23 Months	
Nothing	4.60%	4.30%	2.90%	3.90%
Fertilizer Only	49.80%	50.00%	63.70%	54.60%
Both Fertilizer & Manure	45.60%	45.70%	33.40%	41.50%

In addition, the majority of the respondents (>80%) reported using hybrid maize seeds, purchased from agro-dealers' in their locality and a small proportion (19%) mentioned government's FISP as the source of their seed.

I.R 2.2: Household income increased

Percentage of beneficiaries who used financial services (savings/loans) in the past three months

5.11 Financial Services

In Tiwalere II, Feed and its alliance partners envision increasing the percentage of beneficiaries who use financial services by 67%. In the context of rural Malawi, the majority of people rely on joining village savings and loans (VSL) groups to access such services.

Village Savings and Loans (VSL) are micro-loan schemes aimed at promoting a culture of savings and investment in rural areas. A VSL group is a self-selected unregistered and informal group of individuals who pool their money into a fund from which members can borrow and pay back with an agreed upon interest rates. The regular savings contributions, interest earnings and earnings from other economic activities undertaken by the group are shared out amongst the membership in proportion to the amount that each member has saved throughout the VSL operating cycle. VSL groups are usually made up of 10-25 people and include a Chairperson, Secretary, Treasurer and members.

Analysis of descriptive data from the survey showed that VSLs were uncommon. In a few districts where VSLs existed (Chitipa, Salima, Mangochi and Lilongwe), the proportion of respondents or their family members participating was very small (3.1%). Yet, those who made savings and got a loan from the groups used them in different ways such as meeting children's school needs as well as buying food and agricultural inputs. There is need to invigorate the VSL groups in the districts and educate people (both women and men) to join.

Table 40: VSL membership in the districts surveyed (%)

District	0-5 Months		6-23 Months		24-59 months		Total	
	N	%	N	%	N	%	N	%

Chitipa	81	1.2	95	2.1	95	0.0	271	1.1
Salima	115	1.7	112	0.0	114	0.0	341	0.6
Mangochi	53	11.3	54	1.9	53	6.8	160	8.8
Lilongwe	54	7.4	58	3.4	59	6.8	171	5.8
Total	**303**	**4.3**	**319**	**1.6**	**321**	**3.4**	**943**	**3.1**

Total savings deposits held by microfinance institutions

By the time of this baseline, total savings by members of VSL were found to be MK446, 800 (USD620.56), with an individual member having MK11, 456.41 (US$15.9) on average. Individuals made more savings in Salima (MK26, 666.67 per person) compared to the other districts **(Table 41)**.

Table 41: Total and average savings by members of VSL

District		Mother Category						Total (N)	Total (MK)
		0-5 Months (n)	Total (MK)	6-23 Months (n)	Total (MK)	24-59 months (n)	Total (MK)		
Chitipa	Total	1	20000	2	40000	0	0	3	60000
	Mean		20000		20000		0		20000
Salima	Total	1	40000	2	60000	0	0	3	80000
	Mean		40000		0	0	0		26666.67
Mangochi	Total	8	72000	2	35000	8	22300	18	129300
	Mean		9000		17500		2787.5		7183.333
Lilongwe	Total	6	71000	3	35500	6	71000	15	177500
	Mean		11833.33		11833.33		11833.33		11833.33
Total	**Total**	**16**	**203000**	**9**	**170500**	**14**	**93300**	**39**	**446800**
	Mean		**12687.5**		**18944.44**		**6664.29**		**11456.41**

KRA 3: IMPROVED ADOPTION OF ESSENTIAL HYGIENE ACTIONS AND INCREASED ACCESS TO SAFE WATER BY 298,608 HOUSEHOLDS WITH PREGNANT WOMEN AND CHILDREN UNDER FIVE YEARS (5) OF AGE BY JUNE 2021.

- ### Percentage of households using an improved drinking water source

Improved drinking water sources, according to the Joint Monitoring Programme (JMP), are defined as water sources or delivery points that by nature of their construction or through active intervention are protected from outside contamination, in particular from outside contamination with fecal matter.

Drinking water sources meeting this criteria include:

- Piped drinking water supply on premises;
- Public tap/standpost; tube well/borehole;
- Protected dug well; protected spring; rainwater; and/or
- Bottled water (when another basic service is used for hand washing, cooking or other basic personal hygiene purposes).

All other services are considered to be "unimproved", including: unprotected dug well, unprotected spring, cart with small tank/drum, tanker truck, surface water (river, dam, lake, pond, stream, canal, irrigation channel), and bottled water (unless basic services are being used for hand washing, cooking and other basic personal hygiene purposes).

Given the above definition, 58.5% of the households interviewed in this study had access to improved water sources (in particular boreholes) from where they were drawing water that did not require any treatment prior to use **(Table 42)**. Mchinji had more households with access to improved water sources (83%) followed by Nkhotakota at 67.8% than the other districts. On the other hand, less than half of the households interviewed in Karonga and Lilongwe had access to improved sources of water.

Table 42: Proportions of households drawing water from improved sources (N=1708)

District	Mother Category			Total
	0-5 Months	6-23 Months	24-59 months	
Chitipa	59.5	59.6	52.6	57.1

Karonga	52.2	50.5	52.7	48.5
Nkhotakota	62.1	56.1	85.7	67.8
Salima	55.3	45.5	71.9	57.6
Mangochi	54.2	39.2	57.1	50
Dowa	51.3	51.4	68.4	57
Mchinji	82.2	75.9	90.9	83.0
Lilongwe	53.8	43.9	35.1	44.0
Total	**59.1**	**53.5**	**62.9**	**58.5**

Tiwalere II project already intends to "Increase the number of water points developed, repaired, or rehabilitated" over the coming five years of its implementation. This kind of programming is relevant and timely to help shorten distances and widen access to improved water sources for the rural masses in the targeted districts.

There is also need for Tiwalere II to invigorate and/or facilitate the establishment of water point committees that should look into the maintenance of the water facilities and good use by the community during and after the project to ensure long term benefits.

Average time (in minutes) needed to fetch drinking water

Basically, the total water collection time must be 30 minutes or less for a round trip, including queuing or wait time. In all the districts visited by the baseline survey team, women were the ones drawing water for their households and were taking an average time of 25.56 minutes to get to the water sources and come back home. Of all the villages visited across the entire 8 districts, Zangena in TA Kanfunzira (Nkhotakota) was the only village that reported the lowest water collection time (9.41 minutes).

Table 43: Average time spent to draw drinking water

District	Frequency	Mother Category						Total	
		0-5 Months		6-23 Months		24-59 months			
		# of HH	Total Time	# of HH	Total Time	# of HH	Total Time	# of HH	Total Time
Chitipa	Total	81	2157	95	2296	95	2883	271	7336
	Mean		26.6		24.2		30.3		27.07
Karonga	Total	93	2767	94	2657	95	2826	282	8250
	Mean		29.8		28.3		29.7		29.3
Nkhotakota	Total	58	1515	57	1585	56	699	171	3799
	Mean		26.1		27.8		12.5		22.2
Salima	Total	115	3333	112	3565	114	2015	341	8913
	Mean		29.0		31.8		17.7		26.1
Mangochi	Total	54	1251	54	1726	53	1179	160	4144

	Mean		23.2		32.0		22.2		25.9
Dowa	Total	39	1080	37	1050	38	620	114	2750
	Mean		27.69		28.38		16.32		24.12
Mchinji	Total	73	1655	79	1790	77	965	229	4410
	Mean		22.67		22.66		12.53		19.26
Lilongwe	Total	54	1479	58	1592	59	1776	171	4847
	Mean		27.39		27.45		30.10		28.35
	Total	**567**	**15237**	**586**	**16261**	**587**	**12963**	**1739**	**44449**
Total	**Mean**		**26.9**		**27.7**		**22.1**		**25.56**

- Percentage of households with access to safe drinking water

In this study, the percentage of households with access to safe drinking water was considered to be households that were drawing water from the aforesaid improved sources.

With this definition, the percentage of households with access to safe drinking and cooking water was 58.5% as presented in Table 42 above (page 57).

Percentage of households in target areas practicing correct use of recommended household water treatment technologies

According to USAID, households are counted for this indicator if they are correctly practicing at least one form of evidence-based household water treatment (HWT). HWT is also known as point of use, or POU, treatment, and comprises all methods with a peer-reviewed evidence base shown to improve the microbiological quality of the water to WHO standards of <1 CFU fecal coliforms/100 ml sample.

Specific HWT technologies that are considered for this indicator include (alone or in combination to reach <1 CFU/100 ml):

- Chlorination (chemical disinfection)
- Flocculant/Disinfectant (physio-chemical disinfection)
- Filtration (physical removal)
- Solar disinfection (UV/heat disinfection)
- Boiling (disinfection via heat).

In this study, as shown in Figure 23 close to three quarters of the households (74.4%) that were relying on unsafe sources of water (N=712) were treating water before use. The rest were not treating their water due to either negligence, lack of the necessary purifiers or ignorance on the implications of drinking unsafe water.

All respondents who reported treating water before utilization did so using water guard. This result should be taken with caution since the study did not observe this practice neither did it ask further probing questions about water guard e.g. source, cost, whether it was used on a daily basis, instructions for use to understand what happens in a real life situation and so forth. It is possible that some of the households over reported about water treatment using water guard, yet they were not using it.

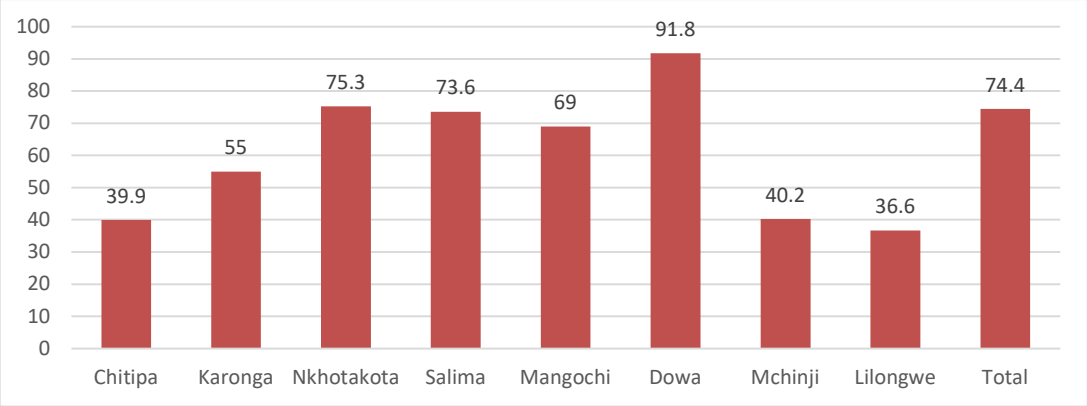


Figure 23: Proportion of households that were treating water from unsafe sources as recommended (N=712)

Practicing of HWT aims to improve the quality of existing drinking water. It must be born in mind though that HWT is not universally effectively against all classes of waterborne pathogens (e.g. free chlorination is ineffective against Cryptosporidium), and requires substantial education and behavior change to ensure correct and consistent use. For this reason, HWT does not automatically / always guarantee access to safe water for drinking and cooking.

Water Gaps in Tiwalere II Districts

There are three main factors contributing to insufficient safe water in Tiwalere districts: scarcity, inadequate maintenance, and insufficient protection. Many communities lack any source of safe water or they have insufficient numbers of functioning boreholes for the population in the communities. Some communities rely on water points that dry out seasonally leading to digging unprotected wells in wet lands and/or using unclean water from rivers and streams. Widespread digging of unprotected wells for irrigation of crops – means there are many unsafe water points that are much closer and less struggle to use than going to the overcrowded or far away boreholes.

In all the districts visited, communities complained about poor maintenance systems for boreholes and gravity fed water tap systems, with many of them breaking down and not being restored to normal function. Unprotected water points and even some 'protected' water points are badly affected by flooding and contamination during the rainy season. HSAs (Health Surveillance Assistants) only make infrequent visits to communities to provide health education and chlorine for water treatment - most villages do not have HSAs and some do not receive visits from any HSA.

More so, there is little attention to water point hygiene in some communities, including lack of fencing to keep out animals, and no drainage for spilled water. People use water points for multiple purposes without keeping the functions separate, for example, mixing up domestic washing (of clothes/dishes/persons), animal watering and getting drinking water at the same water points. Some communities suffer from repeated vandalism of boreholes and taps, to the point that the communities give up on repairing them.

Consequences

Many areas have problems with overcrowding at the boreholes, resulting in long queues and widespread use of unsafe water for drinking, which lead to water borne infections (mainly diarrhea) that contributes to poor nutrition.

Barriers to addressing the problems

Costs for construction of safe water points (boreholes or taps) are much higher than individual households can cover, especially the poorer and more vulnerable households. Sometimes the costs are higher than the small and poor communities can afford, leading to dependency on external resources and/or continued use of unsafe water.



Different types of boreholes used in the districts as sources of drinking and cooking water

5.18 Toilet Ownership and Use

This study assessed ownership of toilets or sanitation facilities by asking the following question to the respondents, "Does your household have a toilet?" Those who said yes were asked to indicate the type of toilet they were owning.

Analysis of the data obtained showed that all the households interviewed had sanitation facilities of some kind, in particular basic unimproved pit latrines without concrete slabs (98.4%). In the MDHS of 2015/2016, ownership of pit latrines was equally high at 92.7%, meaning that a total of 7.2% households had no facilities and were relying on surrounding bushes in times of need (**Figure 24**).

The harmful impacts that result from open defecation include the spread of diarrheal disease, loss of privacy and human dignity, and environmental pollution. Even if a few households continue to practice open defecation, the overall risk of bacteriological contamination and incidence of disease may continue to be high.

Nevertheless, taken together, results from the present study and the MDHS of 2015/2016 mean that rural people have embraced a culture of owning sanitation facilities, which Tiwalere II project needs to nurture and scale up, emphasizing on the need for the construction of improved ones[4].

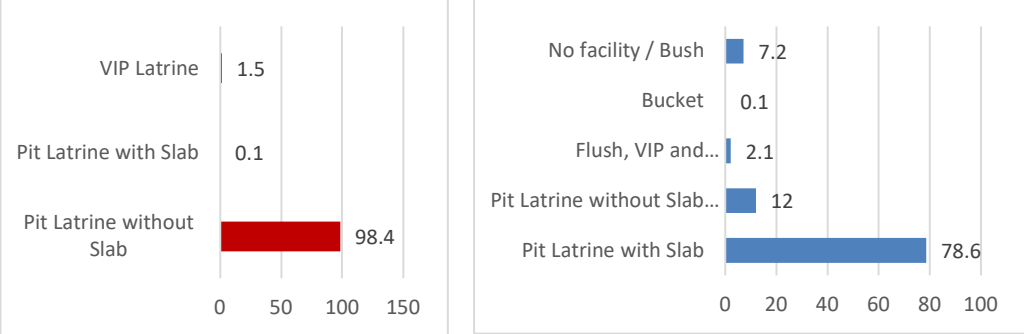


Figure 24: A comparison of toilet facilities between this baseline study and MDHS of 2015/2016 (graph to the right)

[4] A basic sanitation service, defined according to the Joint Monitoring Programme (JMP), is a sanitation facility that hygienically separates human excreta from human contact, and that is not shared with other households. Sanitation facilities meeting this criteria include: 1) flush or pour/flush facility connected to a piped sewer system, 2) septic system or a pit latrine with slab, 3) composting toilets and ventilated improved pit latrines (with slab). All other sanitation facilities do not meet this definition and are considered "unimproved." Unimproved sanitation includes: flush or pour/flush toilets without a sewer connection; pit latrines without slab/open pit; bucket latrines; or hanging toilets/latrines. Households that use a facility shared with other households are not counted as using a basic sanitation facility. A household is defined as a person or group of persons that usually live and eat together.

In the present study, pit latrines with slabs were considered to be those that had concrete floors otherwise (e.g. if wood or mud were used) the latrines were defined as having no slabs. The latter latrines are the ones that are common in rural Malawi. However, in the MDHS survey of 2015/2016 the percentage of households owning pit latrines with slabs (e.g. improved sanitation facilities) was high at 78.6%. It is possible that 'with slab' meant all kinds of toilet floors and 'without slab' connoted disposal of feces in open pits.

This photo shows one of the traditional basic pit latrines with concrete slab, seen in Kenani village in Karonga district. Tiwalere II project need to work with communities to improve the construction of such toilets and ensure they have hand washing facilities and the surroundings are sanitary at all times to make defecation enjoyable and minimize cases of diarrhea.

5.19 How do you dispose young children's feces?

When asked this question, an overwhelming majority of the mothers and care givers (99.2%) said that they use latrines or toilets to dispose children's feces. While open defecation was seemingly very low at 0.8%, the repercussions were huge as such feces end up in rivers and boreholes thereby affecting more people, especially during the rainy season (e.g. the period when this study was conducted).

Table 44: Disposal feces from young children

How do you dispose of feces from young children?	Frequency	Percent
In the toilet	1208	69.5
Pit latrine	517	29.7
In the streams / river	14	.8
Total	**1739**	**100.0**

Is there hand washing facility located close to the toilet?

In total, slightly more than three quarters of the households (77.5%, n=1348; N=1739) had facilities for hand washing located close to their toilets. Observations by the survey enumerators showed that the proportion of households that had water at a specific place for hand washing (e.g. including those with and without hand washing facilities) was 79.8%.

Table 45: Facilities and presence of water for hand washing

Question	Answer	Frequency	Percent
Is there any hand washing facility located close to the toilet for use by users of the toilet	No	391	22.5
	Yes	1348	77.5
Observe the presence of water at the specific place for hand-washing.	Total	1739	100.0
	Water not Available	352	20.2
	Water is Available	1387	79.8
	Total	1739	100.0

In different communities visited by the survey team rural people mounted declarations as the one shown below publicizing their change in behavior from defecating in the open to fixed-point defecation under the *Community-Led Total Sanitation* (CLTS) project co-implemented by the Global Sanitation Fund, Plan Malawi and Concern Universal. Tiwalere II needs to leverage efforts and build on the lessons learned to accelerate impact and coverage.

Use of Detergents after Visiting the Toilet

This study also assessed the use of detergents when washing hands after visiting the toilet as required. Results obtained showed that slightly more than half (56.7%) of the households were using soap to wash their hands after visiting the toilets. One third of the households (33.3%) were using alternatives such as sand and ash, while 10% said they normally do not use any detergents to wash their hands after visiting the toilet.

While sand and ash are not very effective at destroying microorganisms such as those found in the toilet, their use means that people in the communities surveyed were aware that there is need to wash hands with detergents, but affordability remained an

issue. This is a positive result as the project would simply concentrate on encouraging the habit and perhaps helping to brainstorm on proper hand washing when 'alternative or local' detergents are used.

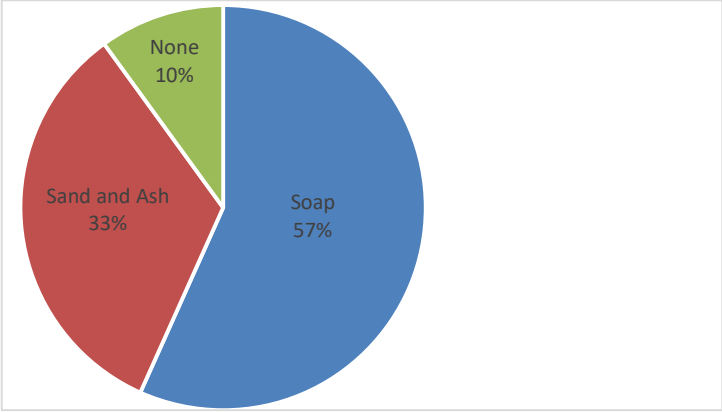


Figure 25: Washing Detergent use N=1739)

5.20 Hand Washing Behaviors

Besides hand washing after visiting the toilets, respondents were also asked to mention other occasions in which they wash hands. The results obtained are presented in **Figure 26** below.

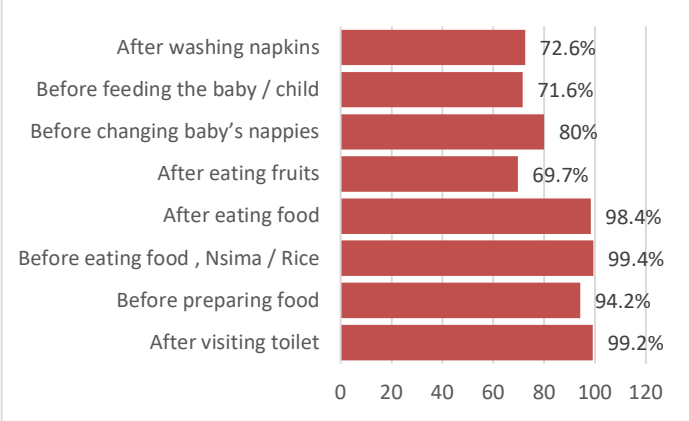


Figure 26: Times for washing hands by women and primary care takers of young children (N=1739)

Overall, Over 90% of the respondents reported that they wash their hands before and after eating food, before preparing food and after visiting the toilet.

The results as shown in **Figure 26** are generally positive, but Tiwalere II project needs to encourage people to wash their hands before and after eating any food including fruits and other snack foods that people may eat while away from home and trust they

are safe for consumption even without washing. Improvements are also needed for hand washing behaviors to promote child care and feeding.

Besides hand washing, the majority of the households had pits dug specifically for rubbish disposal as shown in **Figure 27.**

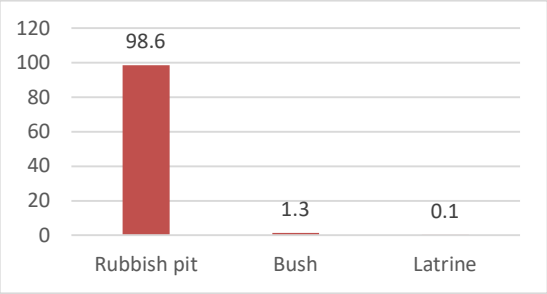


Figure 27: Rubbish disposal in the survey areas (N=1739)

5.16 Firewood and Charcoal Saving Stoves

The baseline survey asked the following question: "Do you have a cooking stove?" to the respondents.

Responses showed that people were generally aware of the cooking stoves in all the districts. However, less than half of the households (43.2%) reported having such stoves mainly in Chitipa (66.1%) and Karonga (58.5%). Lilongwe had the lowest percentage (12.9%) as shown in **Table 46**.

Table 46: Proportion of the respondents who had cooking stove

District	Mother Category			Total
	0-5 Months	6-23 Months	24-59 months	
Chitipa	72.8	62.1	64.2	66.1
Karonga	47.3	56.4	71.6	58.5
Nkhotakota	32.8	26.3	69.6	44.2
Salima	18.3	12.5	60.5	30.5
Mangochi	43.4	37.0	45.3	41.9
Dowa	28.2	27.0	63.2	39.5
Mchinji	27.4	27.8	71.4	42.4
Lilongwe	9.3	19.0	10.2	12.9
Total	**35.7**	**34.8**	**58.9**	**43.2**

Table 46 shows that more mothers with children in the age group of 24-59 had cooking stoves (58.9%) than their counterparts across the districts. The structured questionnaire for this study did not ask follow up questions to find out the reasons for this disparity. Nevertheless, mothers in the aforesaid category were more likely than others to be older, mature and more knowledgeable about cooking and the kind of utensils needed.

Generally, the adoption of new technologies is a gradual process characterized by a sequence of stages and there exists a time delay or lag between initial awareness on a new technology and their subsequent decision to adopt the technology (Masuki et al., 2006).

On type of cooking stove, brick made stoves, was popular (31%) followed by rocket stove (10%) and very few respondents mentioned mud stove (3%). The study also revealed that the respondents were aware of the benefits of using cooking stoves. For instance, the majority of respondents cited that cooking stoves help reduce the amount of firewood (43.4%), decrease the cooking time (14.7%) as well as smoke in the kitchen (8%). The non-users of cooking stoves cited that stoves are expensive and not available in their area as reasons for not using them.

This photo depicts one type of firewood saving cooking stoves that rural people in Malawi locally make and use. Promotion of such stoves by Tiwalere will contribute not only to saving energy which is beneficial to women as they can save time for other household chores but conserving the environment especially now that issues of climate change have become a burgeoning concern in the country.

6.0 Conclusion and Recommendations

The goal of Tiwalere II is to improve the nutritional status of children under five years of age, pregnant and lactating women (PLW), mothers of children under two years of age, and adolescent girls.

This pre-harvest baseline study conducted in December 2016 found that child stunting was of major concern in all Tiwalere II districts with 39 in every 100 children under five years (38.7%) suffering from it. The survey found that in every 100 children 5 were born already deprived and underweight.

The causes of malnutrition were many and include, but were not limited to, suboptimal child feeding practices, inadequate diet, frequent incidences of diseases among young children, and the low socioeconomic status and poor nutritional conditions of many mothers.

Similarly, in all the districts visited diets of mothers and adolescents were too poor to offer adequate amounts of macro and micronutrient as required. The problem was compounded by low livestock production, low involvement in irrigation farming to supplement rain-fed agriculture, lack of financial services, loans and income opportunities as well as the existence of few NGOs working in areas of food, nutrition and livelihood security.

Tiwalere II project proposes to reduce vulnerability to food and nutrition insecurity by embracing an overarching mix of interventions that have proven effective at eradicating suffering and undernutrition among women, adolescents and children under five. The empirical evidence from this study and the local context at hand validate the relevance of Tiwalere II project to be implemented as designed. Notwithstanding the comprehensiveness of interventions, the project is threated by climate change and poor weather conditions typical of the recent years that thwart people's efforts to harvest adequate food for own consumption.

As part of the nutrition-sensitive agriculture and in addition to soil and water conservation measures under this project, Feed the Children and its Alliance Partners should (through care groups and easy to understand IEC materials) include resilience-building activities that communities need to prevent, prepare and manage shocks and repercussions of natural disasters. As an example, strengthening of winter cropping (e.g. through messages and provision of planting materials and inputs) can complement well with VSL and livestock interventions of the project and impact hugely in the lives of people across the project districts.