NUTRITION CAUSAL ANALYSIS

ACTION AGAINST HUNGER

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ETHIOPIA

BORENA ZONE OROMIA REGION

Publication : June 2016

FINAL REPORT

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ETHIOPIA

BORENA-GUJI CATTLE PASTORAL LIVELIHOOD ZONE OF MIYO AND MOYALE WOREDAS, BORENA ZONE, OROMIA REGION

PUBLICATION : JUNE 2016

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ACKNOWLEDGEMENTS

The Nutritional Causal Analysis (NCA) was undertaken with funding from ECHO and OFDA. The NCA was managed by ACF NCA Expert, Christine Plaza with support from ACF Ethiopia Deputy Country Director (Aurelie Carmeille), ACF Technical Advisors in Ethiopia (Jogie Abucejo Agbogan, Sofia Gimenez, Firehiwot Mezgebu, Dawit Bekele, Yibeltal Jemberu) and in France (Celine Sinitzsky, Fabienne Rousseau, Maud Gimenez and Alex Letzelter) who provided key information and support throughout the project. In addition, ACF NCA Unit, Marie Sardier and Blanche Mattern, provided technical guidance and support on implementing the NCA methodology. The NCA would not have been possible without the support of ACF Mega base staff including Field Coordinator, as well as HR, Finance, Logistics and Programme Departments.

We would like to thank each member of the field team for their hard work in gathering data for this survey.

This study was supported by the Oromia Regional Health Bureau as well as Zonal and Woreda authorities. In addition, we would like to thank technical experts from Zonal and Woreda Pastoral Development office, Zonal and Woreda Disaster Preparedness and Prevention offices, Zonal and Woreda Women and Children Affairs offices, Zonal and Woreda Water, Mineral and Energy offices, Zonal and Woreda Health offices, Bule Hora University, and Mercy Corps, who provided key inputs through the NCA preliminary and final workshops.

Most importantly, ACF would like to thank each of the respondents who gave up their time to participate in this survey and for sharing valuable information with our team.

SOMMAIRE

TABLES AND FIGURES

ABBREVIATIONS AND ACRONYMS

ABC	Assisting Behaviour Change
ACF	Action contre la Faim
ANC	Ante-Natal Care
ARI	Acute Respiratory Infection
AWD	Acute Watery Diarrhoea
BC	Behaviour Change
BGP	Borana-Guji cattle Pastoral
CHD	Community Health Day
CI	Confidence Interval
CMAM	Community-based Management of Acute Malnutrition
EDHS	Ethiopian Demographic and Health Survey
ENCU	Emergency Nutrition Coordination Unit
FGD	Focus Group Discussion
FMoH	Federal Ministry of Health
FSL	Food Security and Livelihoods
GAM	Global Acute Malnutrition
HC	Health Center
HDDS	Household Dietary Diversity Score
HEP	Health Extension Programme
HEW	Health Extension Worker
HH	Household
HP	Health Post
HSDP	Health Sector Development Plan
IDDS	Individual Dietary Diversity Score
II	In depth interview
IMNCI	Integrated Management of New-born and Childhood Illnesses
IUD	Intrauterine Device
IUGR	Intra-Uterine Growth Retardation
IYCF	Infant and Young Child Feeding
LBW	Low Birth Weight
LCI	Lower Confidence Interval

KAP	Knowledge, Attitude and Practice
MAHFP	Months of Adequate Household Food Provisioning
MAM	Moderate Acute Malnutrition
MHCP	Mental Health and Care Practices
MNCH	Maternal, New-born and Child Health
MUAC	Mid Upper Arm Circumference
NCA	Nutrition Causal Analysis
NGO	Non-Governmental Organization
NNP	National Nutrition Program
PNC	Post-Natal Care
RC	Replacement cluster
RFS	Risk Factors Survey
SAA	Social Analysis and Action
SAM	Severe Acute Malnutrition
SMART	Standardized Monitoring and Assessment of Relief and Transitions
TBA	Traditional Birth Attendant
TFP	Therapeutic Feeding Programme
WASH	Water Sanitation and Hygiene

EXECUTIVE SUMMARY

1/ INTRODUCTION

Borena zone is a predominantly pastoral zone located in the southern part of Ethiopia bordering Somali region in the east, Northern Kenya to the south, Guji zone to the northeast and SNNPR in the West. It is the largest of the 18 zones in Oromia regional state located in the arid and semi-arid southern lowlands. ACF is working in the area since to address the specific vulnerability of pastoralist and agro-pastoralist communities The Borana-Guji cattle pastoral livelihood zone of Miyo and Moyale woreda in Borana zone, Oromia region, was selected as the study area because the target woredas are suffering chronic and persistent humanitarian crisis. The targeted woredas are often classified hot spot priority 1 and 2.

2/ OBJECTIVES

The main objective of the NCA is to identify the most important causes of child undernutrition, in particular wasting and stunting of children age 0-59 months, in Borana-Guji cattle Pastoral livelihood zone (BGP LZ) of Miyo and Moyale woreda, Oromia region.

The objectives of the study were:

- To identify the main causes of wasting and stunting in the BGP livelihood zone of Miyo and Moyale woredas
- To understand the pathways to causes of wasting and stunting in the target area
- To understand the local seasonal and historical pathways to wasting and stunting
- To use findings in order to inform the program activities that will be implemented in the area by ACF
- To support technical advocacy on causes of wasting and stunting so as to support technical strategy.

3/ METHODS

The Link NCA began in February 2016 with a review of current literature and secondary data to draft hypothesized causal risk factors for undernutrition in The Borana-Guji cattle pastoral livelihood zone of Miyo and Moyale woreda in Borana zone. An initial Stakeholder Technical Workshop with representatives from various sectors and organizations was held in March 2016 to validate the hypothesized causal risk factors for field testing. The data collection began in April and ran for 1.5 months in total. The Link NCA employs a mixed-methods approach, combining both qualitative and quantitative data collection. Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs) were conducted in 4 communities, and a Risk Factor Survey was conducted in 47 clusters at households with children under 5-years, with anthropometric measurements taken of children aged 6-59 months, and females aged 15-49 years. Following data analysis, results were presented for each hypothesized causal risk factors at a final Stakeholder Technical Workshop in May. Through multi-sector working groups, results were validated and a final rating was assigned to each of the causal risk factors based on: prevalence data, NCA survey data, the evidence base for the association between the risk factor and undernutrition, seasonal patterns, qualitative data, and community perceptions (full explanation of Criteria can be found in the Report).

4/ FINDINGS

The results of the SMART nutritional survey show that Global Acute Malnutrition (GAM) prevalence, based on weight-for-height, is estimated at 11.3 % [8.9 – 14.2, 95% CI], with Severe Acute Malnutrition (SAM) estimated at 1.7 % [1.0 - 3.1, 95% CI]. According to MUAC, GAM prevalence is 6.0 % [3.9 - 9.2, 95% CI], with 0.7% SAM cases. Stunting is also well below national and regional figures from Mini DHS 2014 showing 38.2% stunting in Oromia Regional state, but still at a level of medium prevalence of 25.7% [21.3 – 30.6 95% CI] according to the WHO thresholds. Underweight is at 21.0 [16.0 - 26.9 95% CI} with 4.0% [2.6 – 6.9 95% CI] of children severely underweight, slightly less than regional and national DHS figures.

4.1 INADEQUATE CHILDCARE PRACTICES

The Link NCA shows inadequate childcare practices as a main cause to child undernutrition. Practice of prelacteal feeding is common, and infants are not exclusively breastfed. Indeed, the majority of the mothers are giving cow milk and water to infants in addition to breast milk. This practice is inappropriate but also highly at risk regarding the quality of the water. Age of introduction of complementary food was found as inadequate for ¾ of children with introduction of semi-solid food too early (around 4 months) or too late (9 month and above). Moreover, meal frequency is

inadequate. In most of the cases, the workload the mother is a direct cause of inadequate infant and young child feeding practices, since caregivers replace breast milk with cow milk when they are out of the village.

4.2 INADEQUATE CHILD AND MATERNAL FOOD INTAKE

Due to tradition, the intra-household food allocation disfavours women: children eat first, men second and women eat the leftover if any. Moreover, women eat less during their pregnancy, while their nutritional needs are higher, in order to facilitate the delivery. The diet of Borana being based on animal milk, maize and beans, during the dry season people rely on market while their purchasing power is low due to low income and low income generating opportunities. Moreover, the diet is not diversified, more due to lack of knowledge than to unavailability. The dietary intake of mothers and children is therefore inadequate, putting at risk their nutritional status.

4.3 UNHEALTHY ENVIRONMENT

The unhealthy environment that the community lives in was evident. Even if latrines are present in most of the villages, communities are often not aware that inadequate sanitation contributes to disease prevalence, and are not using the latrines due to traditional beliefs. Risks associated to the presence of animal and children feces in the surrounding are not well understood, and knowledge on hygienic environment remains weak. Safe drinking water is insufficient due to the type of water source and its distance, the absence of proper water transportation and storage, as well as the high workload of women not allowing them to fetch as much water as the household needs. Finally, inappropriate hygiene practices and inadequate animal waste management, in particular poultry, were considered as important causes of child undernutrition

4.4 GENDER

Women workload is high since they are in charge of all domestics' chores (fetching water, collecting firewood, cooking, cleaning, and child care taking) and are involved as well on livestock rearing and farming activities. Due to traditions, girls have low educational opportunities, boys being sent in priority to school. Moreover, even if women can make suggestions, majority of decisions are made by men. These are important issues since they have an impact on health, nutrition, hygiene, care practices knowledge what are both related to the increased risk of undernutrition.

4.5 CONCLUSIONS

The Link NCA identified pathways to undernutrition explaining this alarming situation. Analysis from literature review, quantitative and qualitative data, validated by multi-sectorial experts, identified 24 risk factors responsible of child undernutrition in the study area.

Nine risk factors were considered as '***MAJOR***' :

- Women workload
- Low educational opportunities
- Low mothers' food intake during pregnancy and lactation
- Low birth spacing / lack of family planning
- Low rate of exclusive breastfeeding under 6 months
- Practice of prelacteal feeding
- Inadequate access to safe drinking water due to surface water being the main source and long distance (and time) to collect water
- Intra-household food allocation not favoring the women

Ten risk factors were considered as '***IMPORTANT***' :

- Low women's decision power
- Lack of quantity and quality of time spent with children
- Low women nutritional status prior to pregnancy
- Inappropriate complementary feeding practices
- Low access and quality of health facilities and reliance on traditional medicine
- Inadequate hygiene practices in the household
- Exposure to unclean environment
- Low income generating opportunities
- Inadequate access to milk and animal products by children and mothers
- Lack of food diversification/poor diet diversity
- Low level of understanding of nutrition basics

Four risk factors were considered as '***MINOR***'

- Low maternal' well-being
- Lack of care during pregnancy
- Low income due to livestock depletion
- High food access instability

One risk factor was considered as '***UNTESTED***'

- Change in access to pasture

4.6 RECOMMENDATIONS

Based on the results of the NCA, several recommendations can be made.

- Prior to implementation of any programme, it is recommended to spend time to ensure community buy-in. Some communities were indeed less inclined to participate in the NCA survey.
- There is a need of integrated multisectoral response to address these various causes
- Consider all caregivers (mothers, fathers, grandmothers, possibly adolescent siblings) for activities to ensure secondary caregivers are improving practices and fathers are supporting wives in good practices.
- Propomote a Behaviour Change approach (for example the Social Analysis and Action approach from CARE combined with Assisting Behaviour Change Approach from ACF), with strong community participation and considering barriers to behaviour change,
- Since pregnant and lactating women are identified as a nutrition vulnerable group, special attention to include them when designing programs should be given.
- As many hypothesis are related to gender issues, gender consideration have to be mainstreamed in project design
- Timing and location of activities should be carefully thought about to ensure activities have maximum participation without overburdening women. Migration season should also be factored into timings
- To address the various causes identified an integrated multi-sectorial response is recommended

The Link NCA results also provided a number of actionable recommendations (which can be found in the main Link NCA report) to address the identified risk factors for undernutrition in Miyo and Moyale woredas.

INTRODUCTION

Action Contre la Faim (ACF) has been working in Ethiopia since 1985 and started operation in in Borana in 2010 in Moyale town to support the implementation of a WASH project, with AWD prevention as its overall objective. ACF gradually widened the scope of its intervention to address the specific vulnerability of pastoralist and agro-pastoralist communities. Currently ACF is implementing nutrition, WaSH, Food security and livelihood, DRM and Care Practices projects in Moyale, Miyo, Dhas and Dire woredas of Borena zone.

ACF together with scientific partners, have developed a standardized method of analyzing causes of malnutrition (called Link NCA) and consequently improving the relevance and effectiveness of stakeholders programming in a given context. Based on its Nutrition Causal Analysis (NCA) approach and in collaboration with National, Regional and Zonal Government and NGO partners, *ACF conducted a Link NCA in the Borana-Guji cattle Pastoral (BGP) livelihood zone of Miyo and Moyale woredas, Borena zone, Oromia region, from February to June 2016.*

This report presents the findings from the Link NCA study.

METHODOLOGICAL CONSIDERATIONS

1/ WHY CONDUCT A LINK NCA ?

1.1 CONTEXT INFORMATION

Despite recent improvements in undernutrition prevention, treatment and comprehension, child undernutrition continues to be major public health problem in the Oromia Region, with malnutrition rates close to national levels as reflected in the rates of three commonly used anthropometric indicators. According to the last Demographic and Health Survey[1], over one-third (38.2%) of children under 5 are stunted, 18.6% severely stunted, 7.1% are wasted, 1.7% are severely wasted, 22.7% underweight and 7.0% severely underweight.

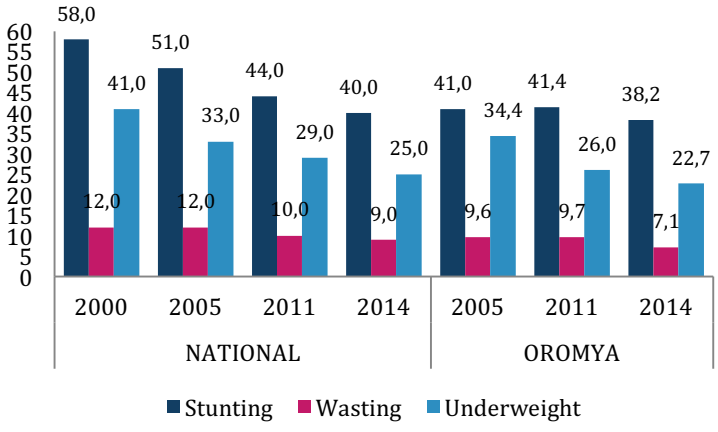


Fig. 1. National and regional trends in nutritional status 2000-2014 from Ethiopian DHS

[1] Mini EDHS, 2014.

Borena zone is a predominantly pastoral zone located in the southern part of Ethiopia bordering Somali region in the east, Northern Kenya to the south, Guji zone to the northeast and SNNPR in the West. It is the largest of the 18 zones in Oromia regional state located in the arid and semi-arid southern lowlands.

The predominant economic activity is pastoralism and agro-pastoralism. Livestock is the vital source of food and income for a population of about 1 million residing in the zone. During recent years, Borena has repeatedly experienced complex humanitarian crises as a result of drought, conflict and disease. Massive livestock deaths due to drought, particularly in the last five years, have badly affected the livelihoods of the communities and the overall food security in the area. For example, Borena was one of the most affected areas in Ethiopia by the 2011 drought.

The Borana-Guji cattle pastoral livelihood zone of Miyo and Moyale woreda in Borana zone, Oromia region, was selected as the study area. This area includes 7 kebeles from Miyo woreda and 16 kebeles from Moyale Woreda, selected using Government livelihood data.

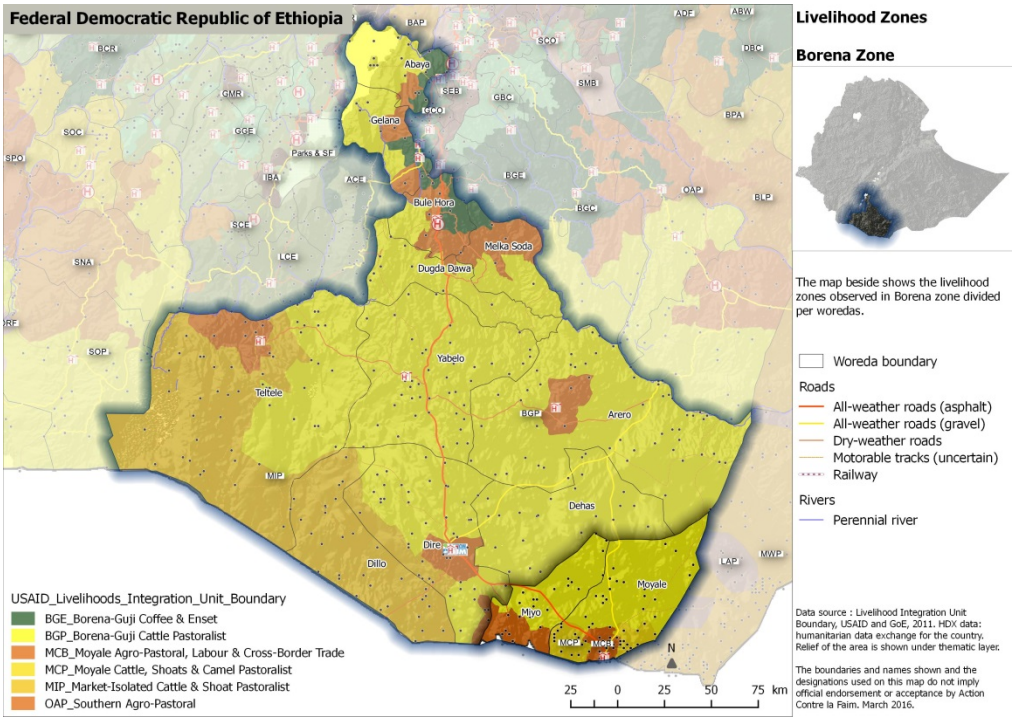


Fig. 2. Map of the study area.

Pastoralists and agro-pastoralists of the target woredas typically pursue low-input/low-output business models that are high risk in terms of outputs over the long term, but attractive due to their low input nature, and hence perceived low risk, in the short term. These groups rely on key ecological systems that have been degraded over many years and face increasing pressures from shifting weather patterns. The combinations of rangeland degradation, soil erosion, and high surface-run-off and low rainfall make livelihoods highly marginal. Weakening social systems such as natural resource governance, extension services, and conflict mitigation mechanisms compounded to high rates of vulnerability and mean even modest deficit or excess rainfall can impact negatively on already low outputs. Additionally communities have very little access to savings or credit facilities. As vulnerability to external shocks and stresses grow, communities may become increasingly risk averse, sticking resolutely to traditional approaches which limit their ability to adapt to climate change. Consequently, communities resort to negative coping strategies, such as increased encroachment on grazing pasture for agricultural use or collection and sale of fuel

wood and charcoal, undermining long-term sustainable livelihoods (selling assets / livestock) and local natural resources.

There is also a high prevalence of WASH related diseases owing to the scarcity of water, sharing of water sources with livestock and very low sanitation coverage. This combination of external pressures contributes to household and community vulnerability, demonstrated by high levels of chronic and acute malnutrition. This has resulted in the targeted woredas suffering from chronic and persistent humanitarian crises. The targeted woredas are often classified hot spot priority 1 and 2.

ACF is actively involved in nutrition, food security and WASH interventions within the area so the Link NCA will serve as an important operational baseline study for future interventions.

1.2 MAIN STUDY OBJECTIVE

The main objective of this Link NCA study is to identify the most important causes of child undernutrition, in particular wasting and stunting of children age 0-59 months, in Borana-Guji cattle Pastoral livelihood zone of Miyo and Moyale woreda, Oromia region.

1.3 SPECIFIC STUDY OBJECTIVE

The NCA study specific objectives include:

- To identify the main causes of wasting and stunting in the BGP livelihood zone of Miyo and Moyale woredas
- To understand specific pathways to causes of wasting and stunting in the target area
- To understand the local seasonal and historical pathways to wasting and stunting
- To use findings in order to inform the program activities that will be implemented in the area by ACF
- To support technical advocacy on causes of wasting and stunting so as to support technical strategy.

2/ THE LINK NCA METHODOLOGY

2.1 OVERVIEW OF THE LINK NCA APPROACH

The Link NCA was developed by ACF in order to strengthen the analytical foundation on which its programs are built. The Link NCA provides a structured and operationally feasible method for conducting a nutrition causal analysis in a specified local context.

All Link NCAs aim to answer the following **6 study questions:**

What is the prevalence and severity of wasting and/or stunting in the study population?

What is the prevalence of known risk factors for undernutrition among the population and key "nutrition vulnerable groups"?

What are the causal pathways of undernutrition by which certain children in this population have become stunted and/or wasted?

How have the stunting and/or wasting in this population and its causes changed a) over time due to historical trends, b) seasonally due to cyclical trends, c) due to recent shocks?

Which causal pathways are likely to explain most cases of undernutrition? Which sets of risk factors and pathways are likely to be the most modifiable by stakeholders within a given context and within a given period?

Based on the causal analysis results, what recommendations can be made for improving nutrition security programming? How can the analysis be linked to a programmatic response?

To answer the 6 study questions, the Link NCA employs a **mixed-methods approach,** combining both **qualitative and quantitative** (from secondary data and/or from a SMART nutrition survey and Risk Factor Survey conducted during the NCA) research methods, and draws conclusions from a synthesis of results.

2.2 STUDY DESIGN

2.2.1 Initial Stakeholder Technical Workshop

An Initial Stakeholder Technical Workshop was held on the 17th March 2016 to validate the proposed hypotheses for the causes of undernutrition, to be field tested during the study. Stakeholders were invited from multiple sectors and multiple types of organization and asked to work in mixed groups to facilitate multi-sectorial discussions and ideas.

2.2.2 Field data collection

The qualitative component was conducted in four villages in the BGP LZ of Miyo and Moyale woreda with selected groups of each community. This survey ran from 1st to 8th April and from the 19th April to 6th May 2016, with 5 days spent in each village.

The Risk Factor and SMART Nutrition Surveys were conducted from the 12th April to the 4th May 2016.

2.2.3 Final Stakeholder Technical Workshop

Findings from the data collection were used for the NCA Analyst to objectively rank causal hypotheses using pre-set criteria. During the qualitative enquiries, on the last day in each village the communities were asked to give a rating to the relevant causal hypotheses for their village and an average was calculated for each hypothesis. Findings and the results of the NCA Analyst and Community ratings were presented to the Stakeholders on 25th May 2016 at a Final Workshop with the objective to reach a consensus on the most important risk factors for undernutrition in the Link NCA study area.

3/ SAMPLING PROCEDURES

3.1 SELECTED METHOD AND SAMPLE SIZE CALCULATION

The method selected was random cluster sampling. A sample size has been calculated for a list of key indicators present on the NCA indicators guide. This list was a sufficient basis to calculate the sample to be surveyed.

RISK FACTOR TO MEASURE	CORE INDICATORS PROPOSED	POPULATION TARGETED BY THE INDICATOR
WASTING	Weight for Height Z score	6-59 months
	Mid-upper arm circumference (MUAC)	6-59 months
STUNTING	Height for Age Z score	6-59 months

RISK FACTOR TO MEASURE	CORE INDICATORS PROPOSED	POPULATION TARGETED BY THE INDICATOR
HOUSEHOLD FOOD ACCESS AND INTAKE	HDDS (Household Dietary Diversity Score)	Household
	HFIAS (Household Food Insecurity Access Scale)	Household
FOOD ACCESS INSTABILITY	MAHFP (Months of Adequate Household Food Provisioning)	Household
INITIATION OF BREASTFEEDING	Early initiation of Breastfeeding	0-24 months
BREASTFEEDING PRACTICES	Exclusive breastfeeding under 6 months	0-6 months
	Continued Breastfeeding at 1 year	12-15 months
COMPLEMENTARY FEEDING PRACTICES	Introduction of solid, semi-solid or soft foods	6-8 months
	Individual Dietary Diversity Score	6-59 months
	Meal frequency	6-23 months
RESPONSIVE FEEDING	Reported responsive feeding	6-59 months
MATERNAL NUTRITIONAL STATUS	Mother's food intake evolution during pregnancy and/or lactation	Mother
LEVEL OF EDUCATION	Caregiver's completed years of education	Caregiver
SOCIAL CAPITAL	Perceived social capital	Mother
CAREGIVER'S WORKLOAD	Caregiver's perceived workload	Caregiver

RISK FACTOR TO MEASURE	CORE INDICATORS PROPOSED	POPULATION TARGETED BY THE INDICATOR
MATERNAL WELL-BEING	WHO5 Well-being Index and Major Depression Inventory (MDI)	Caregiver
CAREGIVER-CHILD INTERACTIONS	Caregiver-child interactions scale	Caregiver
CHILD HEALTH STATUS	Acute Respiratory Infection in past 14 days	0-59 months
	Diarrhoea in the past 14 days	0-59 months
ACCESS TO HEALTH SERVICES	DPT3 Immunization coverage	12-23 months
	Ante-natal Care attendance	Mother
	Barriers to the health centre access	Caregiver
DRINKING WATER QUALITY	Access to a safe water source	Household
	Water management score	Household
HOUSEHOLD WATER SUPPLY	Quantity of water per capita per day	Household
SANITATION FACILITIES	Use of hygienic and safe sanitation facilities	Household
HYGIENE PRACTICES	Food preparer hand-washing practices	Food preparer
	Presence of soap or ashes in the house	Household

Tab. 1. Core indicators

The household (HH) average size is considered to be 5.19 members/HH[2]. The number of children from each age group (0-59 months, 0-6 months, 0-23 months, 6-8 months, 6-23 months, 6-59 months, 12-15 months, 12-23 months) was deduced from the latest demographic and health survey[3].

Table 2 indicates the number of households to be included according to the different indicators.

INDICATORS	POPULATION TARGETED	D[1]	D[2]	P[3]	NB OF MEASURED NEEDED [4]	NB OF MEASURES /HH VISITED [5]	% OF NON RESPONDENT (5 TO 10%)	HOUSEHOLD TO BE INCLUDED
WASTING[4]	6-59 months	1.5	0.03	0.064	418		1.1	602
STUNTING[4]	6-59 months	2	0.08	0.382	309		1.1	445
PRESENCE OF SOAP IN THE HOUSE	Household	2.0	0.10	0.44	206	1	1.05	216
MEAL FREQUENCY	6-23 months	2.0	0.10	0.746	158	0.22	1.05	***747***
ANC ATTENDANCE	Caregiver	2.0	0.10	0.395	200	1	1.05	210
EXCLUSIVE BREASTFEEDING	0-5 months	2.0	0.10	0.569	205	0.07	1.05	2900
EARLY INITIATION OF BREASTFEEDING	0-23 months	2.0	0.10	0.782	141	0.30	1.05	500

[2] SMART nutrition survey in Miyo woreda, Borena zone, ENCU, December 2015

[3] EDHS, 2011.

INDICATORS	POPULATION TARGETED	D[1]	D[2]	P[3]	NB OF MEASURED NEEDED [4]	NB OF MEASURES /HH VISITED [5]	% OF NON RESPONDENT (5 TO 10%)	HOUSEHOLD TO BE INCLUDED
ARI IN THE PAST 14 DAYS	0-59 months	2.0	0.10	0.07	54	0.86	1.05	66
INTRODUCTION OF SOLID, SEMI-SOLID OR SOFT FOODS	6-8 months	2.0	0.10	0.753	156	0.13	1.05	1275
IDDS	6-23 months	2.0	0.10	0.045	36	0.22	1.05	170
CONTINUED BREASTFEEDING AT 1 YEAR	12-15 months	2.0	0.10	0.974	21	0.26	1.05	86
DPT3 COVERAGE	12-23 months	2.0	0.10	0.268	164	0.17	1.05	1005

[1]Design effect; [2]Desired precision; [3]Estimated prevalence; [4]Calculated using ENA Software; [5]calculated by dividing the number of measured needed by the number of measures than could be taken per household visited

Tab. 2. Calculation of household sample to be surveyed

Prevalence of wasting (6-59 months) comes from the SMART nutrition survey done in Miyo woreda in December 2015.

Prevalence of meal frequency, early initiation of breastfeeding, exclusive, breastfeeding, continued breastfeeding at one year, introduction of solid, semi-solid or soft foods and IDDS come from a KAP survey done by CARE in 2014.

Prevalence of Acute Respiratory Infection, ante-natal Care attendance and DTP3 coverage come from the Ethiopian Demographic and Health Survey done in 2011.

In the table 2, only the blue rows were considered since the sample sizes calculated on the orange rows were too high considering the resources available (staff , budget and time) for the NCA. The highest sample size considered was 747 households.

3.2 SAMPLING PROCEDURE FOR THE QUANTITATIVE SURVEY

A two-stage cluster sampling procedure was used. In the first stage, 47 clusters (Annex 1 and 2) were selected according to Probability Proportional to Size (PPS), using village level population data. In the second stage, households within the clusters were randomly selected using a household list obtained in each village. In total, 20 households from each cluster were randomly selected, with only households with children under five administered the survey. In total, 705 households with children under five were surveyed. In addition, child level indicators were collected from 919 children age 0-59 months and anthropometric measurements were collected from 701 children age 6-59 months[4].

3.3 SAMPLE FOR THE QUALITATIVE STUDY

For the first step in the sampling process, four villages, two from Miyo woreda and two from Moyale, were randomly selected from the quantitative survey clusters. The selected villages are detailed in theTable 3.

WOREDA	KEBELE	VILLAGE NAME	POPULATION	RFS CLUSTER NUMBER	QUALITATIVE CLUSTER NUMBER
MIYO	Melbana	Silala	2005	12,13	Village 1
MIYO	Hidi Babo	Midhaga	3438	RC	Village 2
MOYALE	Dambi	Dambi Hora	2934	RC	Village 3
MOYALW	Bede	Harnka Bule	1232	RC	Village 4

Tab. 3. List of the selected villages for the qualitative survey.

[4] The SMART nutrition survey was implemented only in Moyale woreda since data were already available for Miyo woreda.

For the second stage of sampling, in each village, participants whose knowledge would be useful for the objectives of the NCA were purposively selected. Participants included:

Key informants including local government representatives, health workers and traditional birth attendants;

Mothers of children under five. It was decided that mothers would be the most likely to provide information on their children's health, issues related to water and sanitation and their own caring practices;

Fathers of children under five;

Mothers based on the nutritional status of their child.

4/ DATA COLLECTION METHODS

To assess the causes of undernutrition in BGP livelihood zone of Miyo and Moyale woredas, the NCA methodology applied a mixed-methods study design. A quantitative component was designed to objectively assess malnutrition status and the prevalence of known risk factors, while the qualitative component aimed to uncover the community's own conceptualization of malnutrition, the degree to which they perceive it as a problem, and what are observed to be the causes: why some risk factors are prevalent, and the mechanisms by which they are inter-related and lead to malnutrition. Thus, the qualitative and quantitative components are intended to generate complementary data.

4.1 QUANTITATIVE SURVEY

4.1.1 Data collection methods

Risk Factor Survey

A quantitative household questionnaire was designed to collect information on key risk factors. The questionnaire included both household level and child level indicators (collected for all children under five), and included both questions directed to the household head, main caregiver as well as observations (Annexe 3). The household questionnaire covered the following areas:

- Food security;
- IYCF practices;
- WASH;
- Care for women;
- Psychosocial care;
- Health service access and utilization;
- Child health and nutritional status.

The household questionnaire was pretested during the training of data enumerators and team leader in Mega kebele, Dire Woreda[5] on the 11th April 2016. Following pre-testing, the questionnaire was adapted and finalized.

Anthropometric measurements

Anthropometric measurements and oedema were measured to index children aged between 6 and 59 months, as per the SMART guidelines.

4.1.2 Field team composition, recruitment and training

Since the quantitative survey included a SMART nutrition survey, a SMART consultant was hired and he supervised the quantitative survey under the supervision of the NCA analyst.

A total of eight field teams conducted the SMART nutrition survey and the risk factors survey under the supervision of eight supervisors. In addition, two data entry operators were recruited and were responsible for data entry.

Experienced field staffs were recruited for the NCA, all with experience of administering SMART surveys. All field officers and supervisors received a 7 days training between April 5th and 12th. The training included anthropometric measurement using the SMART methodology and how to administer the household questionnaire, and included standardization tests and a pretesting exercise.

4.1.3 Data collection

Data collection took place between the 12th April and the 4th May 2016. On average each field team completed 5 questionnaires per day.

4.2 QUALITATIVE INQUIRY

4.2.1 Research instruments and methods

Data was collected through Key Informant Interviews (KII) and Focus Group Discussions (FGD) in four selected villages.

FGD guidelines were developed covering 9 key sessions (Annex 4):

- Good nutrition and malnutrition
- Food Security and Livelihoods
- Child Health
- WASH
- Child Care Practices
- Mental Health

[5] In order to save time, it was decided to do the pilot test nearby ACF office in Mega town.

- Perception of fathers and grandfathers
- Seasonal and historical trends
- Rating risk factors

4.2.2 Data collection

In total, 5 days were spent in each village where FGDs were organised with mothers, fathers, grandmothers and grandfathers of children under five. Semi-structured individual interviews were held with mothers of SAM, MAM and positive deviant children as well as key stakeholders including kebele leaders, village leaders, health extension workers, and traditional birth attendant.

The last day was dedicated to the presentation and validation of the results of the qualitative inquiry.

In total, 32 FGDs and 21 interviews were held in four villages. The participation is detailed in the table 4:

TOPIC	SILALA	MIDHAGA	DAMBI HORA	BEDE	TOTAL
INTERVIEWS	2	3	3	2	***10***
FGD UNDERNUTRITION (WOMEN)	1	1	1	1	***4***
FGD FSL (MEN)	1	1	1	1	***4***
FGD WASH (WOMEN)	1	1	1	1	***4***
FGD HEALTH (WOMEN)	1	1	1	1	***4***
FGD CARE PRACTICES (WOMEN)	2	2	2	2	***8***
FGD MENTAL HEALTH(WOMEN)	2	2	2	2	***8***
LIFE STORIES	1	3	4	3	***11***

Tab. 4. Summary of qualitative data collection.

4.2.3 Field team composition, recruitment and training

The Qualitative Team consisted of: NCA Analyst, translator, community mobilisers (1 per village), and a driver. The translator received an induction on the NCA methodology, qualitative research, and field translation as well as tests of the discussion guides and tools to be used.

4.2.4 Main challenges

Participation of communities for 5 consecutive days was challenging at times. The decision was made to provide a small gift (soap and iodized salt) to groups who were being asked to attend on several days to encourage continued participation.

Since the qualitative enquiry started at the beginning of the rainy season and most of the targeted communities are engaged in farming, it was sometimes difficult to undertake FGD with men as they were involved in the land preparation and sowing of their farm land.

Moreover, a vaccination campaign was undertaken by health offices in Miyo and Moyale woreda when we were doing the survey in the 3rd village and it was difficult to gather mothers since they had to go to the health Post to vaccinate their children.

Finally, floods occurred when starting the survey in the last village and discussions had to be postponed since villagers were preoccupied and busy.

4.2.5 Team structure

The Link NCA' team structure is shown in figure 3:

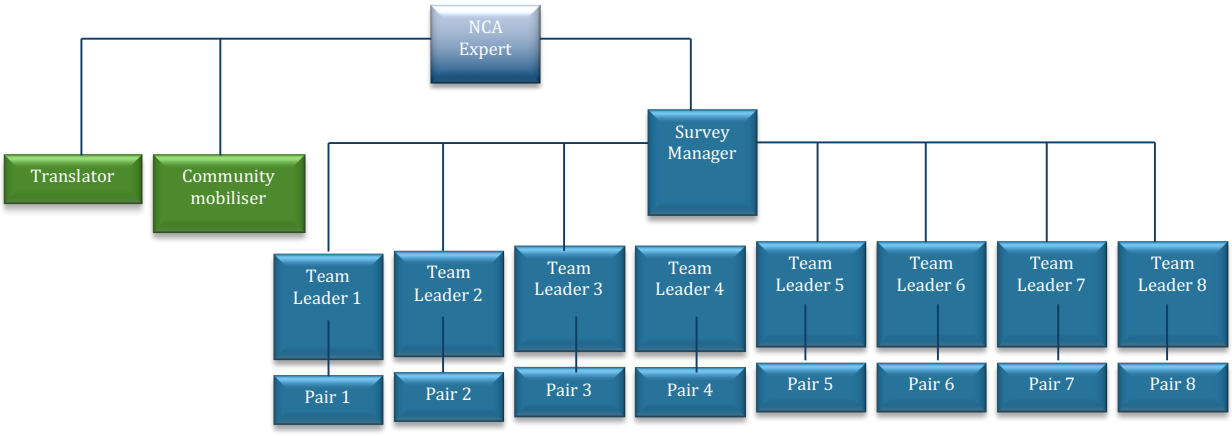


Fig. 3. NCA team structure.

5/ DATA MANAGEMENT AND ANALYSIS

5.1 INITIAL TECHNICAL EXPERT WORKSHOP

The proposed hypothesized risk factors were presented to technical experts at the Initial Technical Expert Workshop. Technical experts were invited to discuss, modify and add hypothesized risk factors. At the end of the workshop stakeholders were asked to rate each hypothesized risk factor. These were then averaged for each hypothesized risk factor.

5.2 QUANTITATIVE DATA MANAGEMENT AND ANALYSIS

Data were entered every day into a database designed in Microsoft Excel 2011. Anthropometric data was entered into ENA Software version April 21st, 2015. Quantitative data analysis was conducted using Excel then Epi Info v.7 and anthropometric analysis was conducted using ENA Software version April 21st, 2015.

5.3 QUALITATIVE DATA MANAGEMENT AND ANALYSIS

The process of qualitative data analysis was on going and iterative. Every evening, transcripts were written down and a weekly summary of key themes developed. The data were analysed using content analysis methods.

5.4 RATING HYPOTHESES

Following data analysis, the NCA expert rated the field-tested causal hypotheses by order of importance and through triangulation of:

- The prevalence of risk factor from secondary data;
- The prevalence of risk factor from the quantitative survey;
- The strength of association between the risk factor and undernutrition;
- The seasonality of causal hypothesis related to seasonality of undernutrition;
- The participatory rating exercise with communities.

Causal hypotheses were rated based on the following classification (table 5):

CATEGORY	CRITERIA
MAJOR RISK factor and pathway	Prevalence of risk factor is classified as ⊕⊕ for ⊕⊕⊕ AND Strength of association from literature review is classified as ⊕ or ⊕⊕ AND Majority of ⊕ or ⊕⊕ for all other sources of primary qualitative and quantitative data collected during the study
IMPORTANT RISK factor and pathway	Prevalence of risk factor is classified as ⊕⊕ for ⊕⊕⊕ AND Strength of association from literature review is classified as ⊕ or ⊕⊕ AND Majority of ⊕ for all other sources of primary qualitative and quantitative data collected during the study
MINOR RISK factor and pathway	Prevalence of risk factor is classified as ⊕ AND Strength of association from literature review is classified as ⊕ or ⊖ AND Majority of ⊕ for all other sources of primary qualitative and quantitative data collected during the study
REJECTED RISK factor and pathway	Prevalence of risk factor is classified as ⊖ AND Strength of association from literature review is classified as ⊖ AND Majority of ⊖ for all other sources of primary qualitative and quantitative data collected during the study
UNTESTED RISK factor and pathway	Information gathered not complete or not available

Tab. 5. Classification of causal hypotheses

5.5 FINAL TECHNICAL EXPERT WORKSHOP

The findings and results of the rating exercise were presented and validated by several stakeholders during the final technical expert workshop held on the 25th May 2016. Technical experts were invited to inform the level of confidence in each rating by giving a confidence note. These were then averaged for each hypothesised risk factor.

6/ ETHICAL CONSIDERATIONS TAKEN DURING THE SURVEY

6.1 RESEARCH ETHICS

The main principles of human research are: respect for persons, beneficence, and justice:

Respect means to respect that each person can make their own choice about whether to participate, and to respect the culture and communities where the research is conducted.

Beneficence means that researchers are responsible for the participants' physical, mental and social well-being. Ethical research should reduce the risks of the participant to a minimum. Additionally, any benefits to the community should be made clear.

Justice means that participants must be recruited equitably, and the researcher should ensure special protected for vulnerable participants.

6.2 ETHICAL APPROVAL AND INFORM CONSENT

Ethical approval was obtained from the Regional Health Bureau Research Ethical Committee on the 10th December 2015. Additionally, informed voluntary consent was obtained from each NCA participant.

6.3 SAM AND SEVERE ILLNESSES PROTOCOL

Children who were found as severely malnourished or with any other medical condition were referred to the nearest health facility for medical attention and appropriate treatment.

7/ LIMITATIONS

7.1 LINK NCA METHODOLOGY LIMITATIONS

The Link NCA presents a detailed, contextualized and local model of the causes of undernutrition and as such the results are only valid for the population studied in the Borana-Guji Cattle Pastoral livelihood zone of Miyo and Moyale woredas. All the results should be considered at this geographic level and not beyond without complementary analysis.

The Link NCA does not provide statistical causal associations. The Link NCA provides prioritization of risk factors, with an inference of strength of causality.

Since the methodology is combining quantitative survey and qualitative enquiry and the time spent with communities differs from one type of survey to another (only 1 hour per HH for the quantitative survey, up to 5 days for the qualitative enquiry), the level of confidence of the communities regarding the surveyor may differ as well as the reliability of the information given.

7.2 LIMITATIONS ENCOUNTERED RELATED TO THE STUDY PRESENTED

Sample size was calculated for a number of key indicators. Due to time and resource constraints, the largest sample size could not be selected. For some indicators we do not have the adequate sample size for desired precisions.

The level of data enumerators was poor and some questions may have been misunderstood, leading to discrepancies between findings of the quantitative survey and the qualitative enquiry.

Since ACF is an NGO active in nutrition, mental health and care practices, food security and livelihood as well as water, sanitation and hygiene' activities in the intervention area, a possible bias in the results may be considered. Participants from the communities may have perceived some benefit from taking part of the survey. This potential threat to the research was mitigated as far as possible by providing detailed information to study participants on the objectives of the NCA, and that the participation would be independent to any NGO or Government support. Furthermore, this potential bias was mitigated in the analysis stage.

LINK NCA FINDINGS

1/ PRELIMINARY WORKSHOP

On the 17th of March 2016, ACF hold an initial technical workshop with 25 national and local experts from the Food Security and Livelihoods, WASH, health, nutrition, MHCP, social sciences sectors (Annexe 5).

The technical workshop aimed at identifying nutrition vulnerable groups and validating a list of causal hypotheses to be field-tested.

1.1 INITIAL CAUSAL HYPOTHESES

Based on the results of a secondary data and literature review on risk factors and pathways to undernutrition, a list of 24 hypothesised risk factors and pathways, were presented to the technical experts. These 24 hypothesised risk factors were debated and individually rated from 1 (hypothesis believed to contribute marginally to undernutrition) to 5 (hypothesis believed to be a major contributor to undernutrition).

The initial causal hypotheses were:

Hypothesis A: Low women's decision power

"In pastoralist societies, women's norm, customs and entitlements are shaped by paternalistic socio-cultural ideas, values and attitudes about gender-related roles and responsibilities[6]". While women have high domestic responsibilities, their participation in household and community decision-making or the control over productive assets and resources is limited. Boys are more valued than girls, and this leads to an unequal access to food consumption, health and education.

Hypothesis B: Women workload

Traditionally, Borana women are responsible for all domestic-related activities chores (including fetching water, collecting firewood,…) as well as some livelihood activities such as looking after small ruminants. Studies have shown that "women spent 5-6 hours a day collecting water, and 1.5-4 hours fetching wood (daily or at least 3-4

[6] CARE, Social norms and barriers analysis for women and girls empowerment in Afar and Borana : social change in a fragile environment? 2015

times a week)"[7]. This is particularly accentuated during droughts as women have to walk longer distance to fetch water. Moreover, it seems that males are not involved in child care practices, leaving this responsibility to women. The high workload of mother has a negative impact on child nutrition status as they have less time to take care of their children and to feed them.

Hypothesis C: Low maternal well-being

Even if it is forbidden by the Ethiopian Penal Code since 2005, Female Genital Mutilation (FGM) is still practiced in Borana zone and the rates remain high at around 90%[8]. It is well known that this practice has short-term and long-term consequences on women health: apart from the physical consequences as severe pain, bleeding, infections, urinary tract infections, as well as complications for both mother and child during childbirth[9], the mental consequences can lead to psychological distress. This combined with high workload, low support to mothers and low decision power affects maternal well-being. Mothers have therefore low capacity to take care of their children.

Hypothesis A and B could be a pathway to the low maternal well-being.

Hypothesis D: lack of quantity and quality of time spent with children

It seems that the time the mothers spend with their children is not optimal in term of quantity and quality. This has an impact on child undernutrition.

Hypothesis A, B, C could be a pathway to the lack of quantity and quality of time spent with children

Hypothesis E: Low educational opportunities

The impact of mothers' education on child nutrition goes beyond its potential effect on nutritional knowledge and improved care practices. A more educated mother is likely to have a higher income (which can directly affect her children's health and nutrition) and higher status and power in the household as well as the community, putting her in a better position to make decisions about her children's needs. Levels of education of caregivers, as well as knowledge and understanding of good nutrition, bad nutrition and causes of undernutrition need to be explored.

Hypothesis F: Low women nutritional status prior to pregnancy

Because access to food is unequal between men and women, and diet quality is poor, women are likely to have a low nutritional status. When it happens prior to pregnancy, it has an impact on undernutrition, especially on stunting.

Hypothesis A and E, could be a pathway to low women nutritional status prior to pregnancy.

Hypothesis G: Low mother's food intake during pregnancy /lactation

It has been reported that mothers decrease their food intake during pregnancy in order to have a small baby and then facilitate the delivery. Yet, a LBW child is more likely to become stunted.

Hypothesis H: Lack of care during pregnancy

While ante-natal care (ANC) is important for mothers' health as they are checked and supplemented with vitamins when needed, and mothers' knowledge on children care,

[7] Ibid
[8] Ibid
[9] An update on WHO's work on female genital mutilation (FGM). Progress report, 2011.

the prevalence of ANC attendance is low in Oromia region (39.5%[10]). Post Natal Care (PNC) for women and child is low as well as mothers do not go for consultation after delivery except if they are sick and traditional healers cannot help them.

Hypothesis A and E could be a pathway to the lack of care during pregnancy

Hypothesis I: Low birth spacing/ lack of family planning

"The number of children below five years of age is associated with increased likelihood that the child is stunted and underweight[11]". After a live birth, the recommended interval before attempting the next pregnancy is at least 24 months in order to reduce the risk of adverse maternal, perinatal and infant outcomes. In Oromia, only 26.2% of women use contraception methods (either modern or traditional)[12], the total fertility rate is 4.4[13] and the mean number of children ever born to women age 40-49 is 7.

Hypothesis E could be a pathway to the low birth spacing since women's who have no formal education are 1.9 times more likely to have short birth interval practices as compare to those having formal education[14].

Hypothesis J: Low rate of exclusive breastfeeding under 6 months

Exclusive breastfeeding under 6 months has been shown to display a protective effect on a child's health. Even if the Borana community seems to have a good acceptance of breastfeeding, only 56.9% of children under 6 months are exclusively breastfeed in Moyale woreda[15].

Hypothesis K: Practice of prelacteal feeding

The practice of giving porridge during the "birth ceremony", or animal milk, plain water or juice is common in the targeted area. According to the KAP survey on IYCF conducted by CARE, the practice of prelacteal feeding in the targeted area (51.4%) is higher than the national average (27%[16]). The practice of prelacteal feeding is harmful as it reduces the infant suckling frequencies and it causes risk of infection.

Hypothesis L: Inappropriate complementary feeding practices

Complementary feeding practices are reported to be inappropriate: it is common to see early initiation of complementary feeding (introduction of animal milk before 6 months of age, and same meal for parents and children), but late introduction of semi-solid or solid food seems to happen also. Moreover, the minimum dietary diversity for children 6-23 months is only reached for 4.5% of them.

Hypothesis M: Differentiated access to health care between males and females

Boys are more likely to be taken to a health center when sick, while girls may be fed herbs and other traditional remedies[17]. Moreover, the cultural norms about women traveling alone and consulting male attendants limit women's access to health care.

Hypothesis A could be a pathway to the differentiated access to health between males and females

[10] EDHS, 2011
[11] Mekonnen & al, 2005. Tackling child malnutrition in Ethiopia. Do the Sustainable Development Poverty Reduction Programme's underlying policy assumptions reflect local realities?
[12] EDHS, 2011
[13] Mini EDHS, 2014.
[14] Begna & al, 2013. Determinants of inter-birth interval among married women living in rural pastoral communities of southern Ethiopia : a case study.
[15] Draft report on baseline IYCF KAP survey in Moyale and Dire woredas of Borena zone, Oromiya region, CARE, February 2014.
[16] Ethiopian Demographic and Health Survey, 2011.
[17] Watson, 2010. Gender Issues and Pastoral Economic Growth and Development in Ethiopia,

Hypothesis N: Low access and quality of health facilities and reliance on traditional medicine

Even if the health facilities exist in the area, some of them are not functional, other faces medical supply gaps. The medical personnel of these structures are not always available especially if there is a medicines gap. The women are sometimes reluctant to walk long distances to go to the health center when they know that it may be closed or without drugs. Moreover, it seems that pastoralist in that area relies on traditional healers when they are sick.

Hypothesis O: Inadequate hygiene practices in the household

Poor hygiene practices can negatively impact child nutritional status due to exposure to pathogens, which may cause illness, with diarrheal disease being the most common among children under 5. According to the KAP survey carried out by ACF in February 2015, the knowledge of hand-washing is reportedly high, but only 52.3% caregivers wash their hand before feeding children, and the hand-washing with soap or ashes may not be widely practiced.

Hypothesis P: Inadequate access to safe drinking water due to surface water being the main source of water, and long distance (and time) to collect water

Inadequate and/or poor access to safe drinking water is directly related to high prevalence of diseases and can impact negatively child nutritional status. The major source of water (pond, 42%[18]) is surface water which might be easily contaminated due to various pollutants. Besides, surface water is directly depending on the climate condition and from time to time the water sources are getting dry. Almost 31% of the population in the targeted area take 1h30 to 3h00 to fetch water, meaning that they are most likely to collect less water than needed to satisfy basic water needs[19].

Hypothesis Q: Exposure to poor sanitary conditions / unhealthy environment

Directly contributes to the development of unhealthy environment and impact negatively child nutritional status due to exposure to pathogens, which may cause illness, with diarrheal disease being the most common among children under 5. If the outlet of feces is not well isolated from the environment by the use of appropriate sanitation facilities, it can contaminate water, food and insects that can in turn contaminate food and water. According to the KAP survey carried out in February 2015[20] in the area, even if almost 95% of respondent construct their own latrine, the majority of the structures are not improved and often not properly used. Moreover, children spend more time in an environment where they are exposed to human feces as well as animal feces and they can ingest dirt containing fecal bacteria. This lead to chronic diarrhea and intestinal infections ad enteropathy

Hypothesis R: Low income due to livestock depletion

In the targeted woredas, the communities are mainly pure pastoralists (80% in Miyo, 70% in Moyale)[21], and some are agro-pastoralists (15% in Miyo, 25% in Moyale). Their economic activity relies on livestock rearing; the number and condition of these livestock determine a household's wealth and ability to continue its traditional livelihood pattern. Milk and milk products represent an important source of food, and income is mainly obtained from the sale of livestock and livestock products. Due to recurrent drought, there is a decrease in pasture and water availability impacting the

[18] ACF,2015. End line KAP Survey conducted in the framework of ECHO funded resilience project.
[19] UNICEF-WHO, 2008. Progress on Drinking Water and Sanitation. Special Focus on Sanitation.
[20] ACF, 2015. End line KAP Survey conducted in the framework of ECHO funded resilience project.
[21] ACF, Participatory Vulnerability Risk Capacity assessment Dhas, Miyo and Moyale woredas, Borena zone.

body condition of animals, sometimes leading to their death. Livestock herds are depleting and their recovery to pre-drought levels takes many years, pastoralists' income is therefore low.

Hypothesis S: Low income generating opportunities

Income generating opportunities are scarce and consist mainly of agriculture (sale of crop production), petty trading (mainly done by women), casual labour, sale of charcoal.

Hypothesis T: Inadequate access to milk and animal products by children and mothers

Milk is very important in pastoral diets. Erratic rainfall implies a decrease in pasture and water availability for animals, leading to a deterioration of livestock body condition and/or livestock death. Milk' production is therefore decreased, either in quantity or quality, decreasing pastoral households' food intake.

Hypothesis R could be a pathway to the inadequate access to milk animal products by children and mothers

Hypothesis U: High food access instability

Pastoralists access grain by the selling of livestock. During dry periods, the livestock body conditions are bad and the term of trade grain/animal is disfavoring the pastoralists, their access to food is therefore low.

Hypothesis R and S could be a pathway to the high food access instability

Hypothesis V: Lack of food diversification/poor diet diversity

It seems that for children, until two years, the common and staple foods are breast milk and cow's milk[22]. Moreover, the food of adult is not diversified either and the access to food is unequal between men and women.

Hypothesis W: Intra-household food allocation discriminating the women and girls

Intra-household food allocation is an important part of food security, as not all household members may have equal access to sufficient, safe and nutritious food. It seems that due to traditional norms, girls and women are disfavored for food consumption[23].

Hypothesis A could be a pathway to the intra-household food allocation discriminating women and girls

Hypothesis X: Change in access to pasture

Rangeland is the most important natural resource in pastoral areas. "Pastoralists manage their livestock herds by managing their rangelands and their mobility across those rangelands[24]" Borana pastoralists have different types of enclosures with various forms of customary management, control and access. The traditional "*kallos*" are communal enclosures who were initially not fenced and which purpose was to conserve pasture or put aside a section of rangeland for milking cows, calves and sick animals during the dry season/times of drought. Since the 1980's, "*kallos*" are mostly fenced, and there are more and more NGO-initiated and government-initiated kallos, which are not managed according to the customary laws. Moreover, private

[22] Melkamu & al, 2015. Borana Oromo parents post-partum infant care and socialization, Southern Oromiya, Ethiopia.
[23] Watson, 2010. Gender Issues and Pastoral Economic Growth and Development in Ethiopia,
[24] Pavanello & Levine, 2011. Rules of the range : Natural resource management in Kenya-Ethiopia border areas.

enclosures are increasing either for agricultural purposes (promoted by government policies as livelihood diversification) or commercial livestock fattening purpose (promoted by government as well). These enclosures are often taking the most productive and fertile land from the common range, and the land available for communal grazing is reducing. This implies an unequal access to grazing lands since poor pastoralists have limited access to private *kallos* and "wealthier pastoralists benefit more because they have more animals that can use the *kallo*"[25].

1.2 HYPOTHESES TO BE FIELD-TESTED

The different hypotheses were discussed and a consensus was reached on the hypotheses to be field-tested : most of the proposed hypotheses were accepted, one was rejected, one was modified and a new hypothesis was added table 6:

VALIDATED	A TO L, N TO V, X
REJECTED	M
MODIFIED	W
ADDED	Y

Tab. 6. Hypotheses validated, rejected, modified or added during initial technical workshop.

Among the validated hypotheses, some of them were subject to debate:

Hypothesis A : *Low women's decision power :* according to one group, the most important factor is whether the decision is right or wrong, more so than the gender relationships as play in decision making process.

Hypothesis I : "*Low birth spacing/ lack of family planning*" was subject to debate since it seems that in Miyo woreda, where there are only Borana, there is a traditional form of family planning (men and women do not have sexual relation during two years after delivery), whereas in Moyale, where there are several clans, among which *Gabras* and *Geris* who follow the *charia* law (which prohibits the use of family planning methods), there is no traditional family planning. According to some participants the mentioned clans mainly reside in 6 kebeles of Moyale woreda and their proportion compared to the total in the study area is low.

During the discussion, the question of family size and early marriage was raised: even if official as well as customary[26] age to be married is 18 years old, in Borana culture,

[25] Napier and Desta, 2011. Review of pastoral rangeland enclosure sin Ethiopia.

[26] Gadaa traditional system

girls can marry from 15 years old and have child every 2-3 years within their reproductive period. This leads to high family size and has impact on undernutrition. This has not been admitted as a new hypothesis since majority of participants think it is negligible in terms of number of people in the targeted area.

Hypothesis T: *"Inadequate access to milk and animal products by children and mothers":* according to one group, access is not a problem, whether the resource is adequate or not. Another group proposed to reformulate the hypothesis as "*unsustainable access to milk and animal products by children and mothers*", but finally the original hypothesis was kept.

Hypothesis M : "*Differentiated access to health care between males and females*" was rejected because according to participants it is not true in the Borana context, men as well women can access health care.

Hypothesis W : "*Intra-household food allocation discriminating the women and girls*" was modified. Indeed, participants said that women and girls were not discriminated since they were the ones preparing the food and serving it to the family and "women and/or girls cannot discriminate themselves" or make discrimination between family members. In Borana culture children are prioritized in term of food (they eat first). Husbands do not complain even if they are served with small amount of food.

After further explanation on the meaning of discrimination, participants considered this term inappropriate and preferred to use the term of "prioritization" or "favoring". Finally the hypothesis was reformulated as follow: "**Intra-household food allocation not favoring women"**

A new hypothesis was proposed **Hypothesis Y:** "*Low level of understanding of nutrition basics*" and validated by a majority of participants. It seems that even if awareness on nutrition basics (nutritious food, healthy practices) has improved a lot, the practice of good nutrition is low. There exists a need for continuous efforts of health and nutrition promotion. Even if some participants were a bit lukewarm about the proposition, a consensus was reached to keep it.

Technical experts individually rated the 24 original causal hypotheses from 1 (hypothesis believed to contribute marginally to undernutrition) to 5 (hypothesis believed to be a major contributor to undernutrition) table 7.

HYPOTHESES	AVERAGE NOTE
Hyp A : Low women's decision power	3.48
Hyp B : Women workload	3.71
Hyp C : Low maternal well-being	3.57
Hyp D: lack of quantity and quality of time spent with children	3.29
Hyp E : Low educational opportunities	4.24
Hyp F : Low women nutritional status prior to pregnancy	3.76
Hyp G : Low mother's food intake during pregnancy /lactation	3.86
Hyp H : Lack of care during pregnancy	3.81
Hyp I : Low birth spacing/ lack of family planning	3.29
Hyp J : Low rate of exclusive breastfeeding under 6 months	4.10

Hyp K : Practice of prelacteal feeding	3.62
Hyp L : Inappropriate complementary feeding practices	4.05
Hyp M : Differentiated access to health care between males and females	Rejected
Hyp N : Low access and quality of health facilities and reliance on traditional medicine	3.76
Hyp O : Inadequate hygiene practices in the household	3.90
Hyp P: Inadequate access to safe drinking water due to surface water being the main source of water, and long distance (and time) to collect water	4.05
Hyp Q : Exposure to unclean environment	4.05
Hyp R : Low income due to livestock depletion	4.10
Hyp S : Low income generating opportunities	3.90
Hyp T : Inadequate access to milk and animal products by children and mothers	2.95
Hyp U: High food access instability	3.67
Hyp V : Lack of food diversification/poor diet diversity	4.24
Hyp W : Intra-household food allocation not favoring the women	2.81
Hyp X : Change in access to pasture	3.90
Hyp Y : Low level of understanding of nutrition basics	3.48

Tab. 7. Rating of causal hypotheses to be field tested

Hypotheses E and V were mostly considered as major hypotheses while hypotheses T and W were mostly considered as minor ones by the participants.

1.2.1 Nutritional vulnerable groups

The working groups identified the following nutrition vulnerable groups by order of priority:

- Pregnant and Lactating women
- Children under 5 years
- Elders

2/ CHARACTERISTICS OF THE STUDIED POPULATION

2.1 HOUSEHOLD COMPOSITION

In total, 705 households were surveyed and child level indicators were collected from 701 children age 0-59 months. The size of households varied from 2 to 15 with an average of 6.03 members per household. In almost all cases, the head of the household was man age 18 or over (87.66%) whose marital status was married (91.63%).

In 95.46% of households, the main caregiver of children under five was the mother and 91.63% were married while 4.68% were widow (table 8).

INDICATORS	SAMPLE	MEAN OR PROPORTION	LOWER CONFIDENCE INTERVAL (LCI) 95%	UPPER CONFIDENCE INTERVAL (UCI) 95%
HEAD OF HOUSEHOLD	705			
MAN < 18 YEARS		0.14	-0.14	0.42
MAN > 18 YEARS		87.66	85.23	90.09
WOMAN < 18 YEARS		0.57	0.01	1.12
WOMAN > 18 YEARS		11.63	9.26	14.00
HOUSEHOLD SIZE	705	6.03	5.87	6.19
MAIN CAREGIVER	705			
MOTHER		95.89	94.42	97.36

INDICATORS	SAMPLE	MEAN OR PROPORTION	LOWER CONFIDENCE INTERVAL (LCI) 95%	UPPER CONFIDENCE INTERVAL (UCI) 95%
FATHER		2.55	1.39	3.72
GRAND-MOTHER		1.56	0.64	2.48
AGE CAREGIVER	705	29.30	28.68	29.91
AGE 1ST DELIVERY	705	18.14	17.99	18.291
MARITAL STATUS	705			
MARRIED		91.63	89.58	93.68
SEPARATED		3.55	2.18	4.92
SINGLE		0.14	-0.14	0.42
WIDOW		4.68	3.12	6.24

Tab. 8. Household composition indicators.

2.1.1 Background characteristic of qualitative study participants

Estimated age of mothers and fathers was between 17 and 50 years old. The estimated age of grandparents was between 40 and 80. The number of children ranged from 1 to 12, with number of children correlated with the age of the parents

In Miyo woreda, most of the families are following a traditional family structure (two parents with their children) while in Moyale woreda there was more polygamous families (two wives per husband). No single parents were represented, but several widows participated in the discussions.

Most of the women met never attended school, but younger women seemed to be more aware of some topics discussed due to the effective presence of Health Extension Worker in some of the villages.

All the women describe themselves as housewives and help their husband for the farming and animal rearing. Some women were involved with their husband in petty trading.

2.1.2 Overview of villages from the qualitative enquiry

The main activities in the area are livestock rearing and farming of maize and beans. There is also a growing trend of firewood collection and selling. For the villages selected in Miyo woreda, the main markets are in Hidi (Miyo woreda) or Mega (Dire woreda), while for the ones selected in Moyale woreda, the main markets are in Moyale town (Ethiopia side) and Moyale town (Kenya side). Distance to markets varied between one to eight hours walk, but motor bikes and car are now ensuring the transport of people and animals.

Most households have livestock, which are often used for consumption (milk and meat), transport, as well as a safety net when needed. Half of the households seem to have some access to land for farming.

Two villages have hand-pumps and two depend on dams or ponds for drinking purposes. In two villages almost all the households have their own latrines, and in the two others, villagers are sharing latrines. But in the four villages latrines are not always used, and open defecation is common. Distance to health facilities (Health Center / Health Post) varies, one village is 10 minutes from the nearest Health Post whereas others are up to 1h30 minutes. The two communities in Moyale woreda are used to going to the health center or the hospital in Kenya.

3/ UNDERNUTRITION

3.1 ANTHROPOMETRIC RESULTS[27]

The results of the SMART nutritional survey[28] (table 9) show that Global Acute Malnutrition (GAM) prevalence, based on weight-for-height, is estimated at 11.3 % [8.9 – 14.2, 95% CI], with Severe Acute Malnutrition (SAM) estimated at 1.7 % [1.0 - 3.1, 95% CI]. According to MUAC, GAM prevalence is 6.0 % [3.9 - 9.2, 95% CI], with 0.7% SAM cases. Stunting is also well below national and regional figures from Mini DHS 2014 showing 38.2% stunting in Oromya Regional state, but still at a level of medium prevalence of 25.7% [21.3 – 30.6 95% CI] according to the WHO thresholds. Underweight is at 21.0 [16.0 - 26.9 95% CI} with 4.0% [2.6 – 6.9 95% CI] of children severely underweight, slightly less than regional and national DHS figures. In this Link NCA report, we use WHO standards. In the attached SMART report however, NCHS standards are used.

[27] Based on WHO standards 2006
[28] The SMART nutrition survey has been done in Moyale woreda only since data on Miyo woreda was already available.

	CRITERIA	PREVALENCE (%)	LOWER CONFIDENCE INTERVAL (LCI) 95%	UPPER CONFIDENCE INTERVAL (UCI) 95%	REGIONAL DATA MINI DHS 2014	NATIONAL DATA MINI DHS 2014
GLOBAL ACUTE MALNUTRITION (GAM)	WHZ<-2.0 and/ or oedema	11.3	8.9	14.2	7.1	8.7
	MUAC<125 and/ or oedema	6.0	3.9	9.2		
MODERATE ACUTE MALNUTRITION (MAM)	-3.0 ≤ WHZ < -2.0	9.6	7.6	11.9		
	11.5≤MUAC< 12.5	5.3	3.4	8.2		
SEVERE ACUTE MALNUTRITION (SAM)	WHZ<-3.0 and/ or oedema	1.7	1.0	3.1	1.7	2.5
	MUAC<11.5 and/ or oedema	0.7	0.3	1.7		
STUNTING	HAZ<-2.0	25.7	21.3	30.6	38.2	40.4
SEVERE STUNTING	HAZ<-3.0	8.1	6.0	11.0	18.36	18.7
UNDERWEIGHT	WAZ<-2.0	21.0	16.0	26.9	22.7	25.2
SEVERE UNDERWEIGHT	WAZ<-3.0	4.0	2.6	6.9	7.0	7.2

Tab. 9. Anthropometric results for 701 children aged 6-59 months

Such discrepancies between levels of stunting and underweight and regional figures have also been experienced in a number of other recent anthropometric surveys within Oromia.

Table 10 shows that the prevalence of undernutrition is higher among boys. This can be explaining by the difference of feeding practices between boys and girls (*cf §4.2.9.*)

	CRITERIA	PREVALENCE BOYS (%)	PREVALENCE GIRLS (%)
GLOBAL ACUTE MALNUTRITION (GAM)	WHZ<-2.0 and/ or oedema	12.8 % [9.3 - 17.5 95% C.I.]	9.6 % [6.5 - 14.1 95% C.I.]
	MUAC<125 and/ or oedema	6.3 % [3.5 - 11.2 95% C.I.]	5.6 % [3.3 - 9.4 95% C.I.]
MODERATE ACUTE MALNUTRITION (MAM)	-3.0 ≤ WHZ < -2.0	10.3 % [7.3 - 14.4; 95% C.I.]	8.7 % [5.7 - 13.2; 95% C.I.]
	11.5≤MUAC<12.5	5.2 % [2.7 - 10.0 95% C.I.]	5.3 % [3.3 - 8.6 95% C.I.]
SEVERE ACUTE MALNUTRITION (SAM)	WHZ<-3.0 and/ or oedema	2.5 % [1.2 - 5.2 95% C.I.]	0.9 % [0.3 - 2.8 95% C.I.]
	MUAC<11.5 and/ or oedema	1.1 % [0.4 - 2.9 95% C.I.]	0.3 % [0.0 - 2.2 95% C.I.]
STUNTING	HAZ<-2.0	27.4 % [21.7 - 33.9 95% C.I.]	23.9 % [18.3 - 30.6 95% C.I.]
SEVERE STUNTING	HAZ<-3.0	10.1 % [7.0 - 14.4 95% C.I.]	6.1 % [3.3 - 10.8 95% C.I.]

	CRITERIA	PREVALENCE BOYS (%)	PREVALENCE GIRLS (%)
UNDERWEIGHT	WAZ<-2.0	23.5 % [18.0 - 30.1 95% C.I.]	18.2 % [12.8 - 25.2 95% C.I.]
SEVERE UNDERWEIGHT	WAZ<-3.0	5.0 % [3.3 - 7.7 95% C.I.]	3.0 % [1.3 - 6.7 95% C.I.]

Tab. 10. Anthropometric results by sex.

3.2 NUTRITION VULNERABLE GROUPS

During the Initial Stakeholder workshop: PLW, children under 5 years and elders were identified as a nutritionally vulnerable group.

According to MUAC, the percentage of undernourished women of child-bearing age is 12.15%, with 0.26% of SAM (table 11).

WASTING BY MUAC	%	LOWER CI 95%	UPPER CI 95%
NORMAL (MUAC ≥ 22 CM)	87.60	84.30	90.90
UNDERNUTRITION (MUAC <22 CM)	12.15	8.88	15.41
SEVERE WASTING (MUAC < 19 CM)	0.26	-0.25	0.77

Tab. 11. Women of child-bearing age nutritional status based on MUAC.

Figure 4 shows that SAM as well as MAM increases after 18-29 months and after 42-53 months.

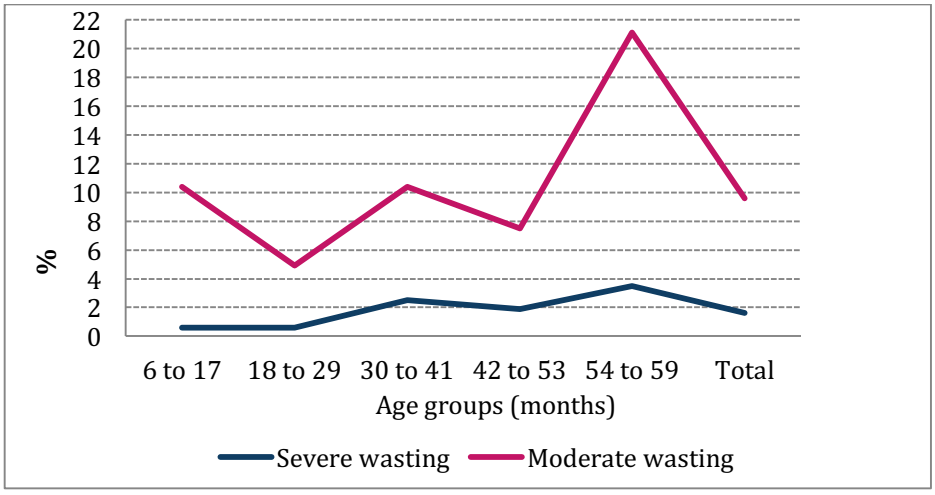


Fig. 4. **Prevalence of wasting based on Weight-For-Height by age group**

Figure 5 shows that the risk of stunting increases at 6-17 months of age as is expected from global results, this is often linked with the period of transition from exclusive breastfeeding to complementary foods.

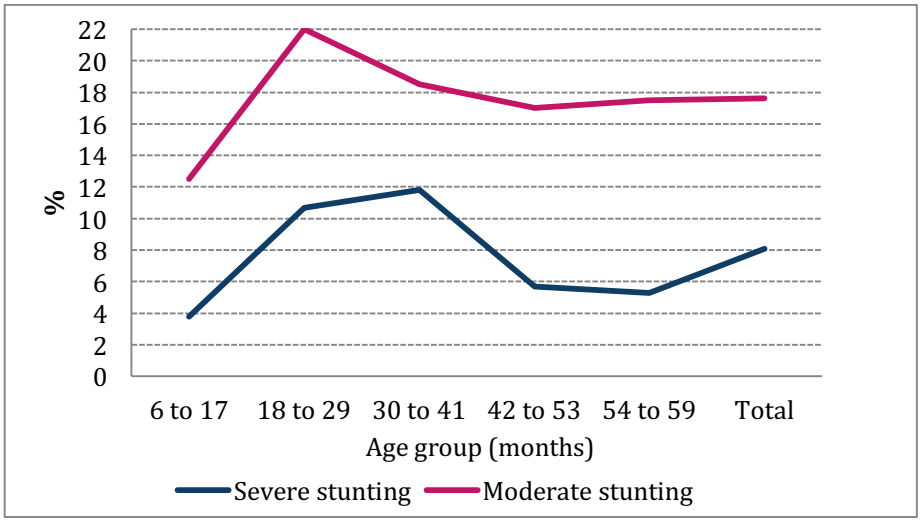


Fig. 5. **Prevalence of stunting by age group**

3.3 LOCAL DEFINITION AND UNDERSTANDING OF GOOD NUTRITION AND UNDERNUTRITION

3.3.1 Local definition of undernutrition

The local term for undernutrition is "HANQINA NYATTAA" (lack of food), or "DUKUBA" (disease you get when you are undernourished). Definitions of undernutrition differ across the four communities, but all had common themes of "not eating enough", which was specified as "not eating enough nutritious food". In one village there was a

common perception that poor linear growth was due to genetics, with the justification that the child is not sick, he is eating enough but he doesn't grow as other children of his age because his parents aren't tall. In two communities (the ones depending on dam or pond) the role of water quality and hygiene in poor child growth was also noticed. The following were the accepted definitions of undernutrition for the four villages:

« A disease usually brought by lack of food or body and environment cleanness" (Silala)

"A disease caused by starvation, lack of food or if food is available but not well prepared, or because you drink dirty water" (Midhaga)

"It is a non-contagious disease due to lack of food, illness, lack of environmental and body cleanness, lack of safe water" (Dambi Hora)

"It is a disease due to the lack of food and the pregnancies at early stage » (Harnka Bule)

3.3.2 Local perception of undernutrition

A common perception of undernutrition was not having enough food, or enough nutritious food. Nutritious food was always specified as cow milk. Undernutrition was often described as child becoming weak, feeling dizzy and sleepy, not eating or playing well, with a body swelling. There was also the perception of not having smooth skin and being pale with yellow eyes.

The most common words used to describe an undernourished child were: "BOBOSAA" (body swelling), "HALU" (thin), "GARAGUDA" (stomach is big), "YARU" (child thin, not able to stand-up). There was also a perception of "dryness of the skin" and of "having no blood" (anaemic, pale).

Different types of undernutrition were sometimes defined: in two communities they differentiated the swelling and weakness of the body, from not growing properly compared to other children of the same age.

3.3.3 Local perception of good nutrition

In all the villages, participants considered good food as cow milk which is "a food who gives you fat body and strength". For babies, breast milk was also considered as good food if completed with cow milk. For others, "good food is the food you have provided that it is well prepared (adding cow milk)". Few mothers considered fruits as good food as well. None of the participants knew what food groups were. Mental health and care practices

3.4 DESCRIPTION OF MHCP CONTEXT

The National Nutrition Program (NNP)[29] is being revised and two of its strategic objective are:

"Improve the nutritional status of Children under ten" through initiatives among which promotion of optimal breastfeeding practices for children under 6 months, promotion

[29] National Nutrition Programme, June 2013- June 2015, government of Federal Democratic Republic of Ethiopia.

of appropriate complementary feeding for 6-24 months old, promotion of appropriate dietary practices for children 24-59 months old, and prevention and control of micronutrient deficiencies for all ages.

"Improve the nutritional status of women (15-49 years) and adolescents (10-15 years)" through provision of comprehensive routine nutritional assessment, counseling and support services, ensuring that adolescent and PLW have access to micronutrient services

Several sectoral strategies exist to mainstream nutrition into other NNP implementing sectors. The overall goal of the national IYCF strategy[30] is to improve IYCF practices in the country through essential nutrition actions (ENA), an action-oriented approach that focuses on promoting 7 clusters of nutrition behaviors that have been empirically proven to reduce morbidity and mortality. The seven ENA areas include: promoting optimal breastfeeding, promoting optimal complementary feeding at 6 months, nutritional care of the sick child during and after illness, improving women's nutrition, controlling anemia, vitamin A deficiency, and iodine deficiency.

Ethiopia has very poor IYCF practices: exclusive breastfeeding is relatively low (73%[31]) at national level and even worse at Oromia region level (57.1%[32]). According to the IYCF KAP survey done in 2014[33], exclusive breastfeeding is lower (56.9%) than the regional average, but the continued breastfeeding at 1 year is high (97.4%). This study highlighted as well that the practice of prelacteal feeding (51.4%), which is one of the most harmfull practice as it causes risk of infection and reduces the infant suckling frequencies, is much higher than the national average which was found to be 27%[34].

Complementary feeding practices are reported to be inappropriate: it is common to see early initiation of complementary feeding (introduction of animal milk before 6 months of age, and same meal for parents and children), but late introduction of semi-solid or solid food seems to happen also. Moreover, the minimum dietary diversity for children 6-23 months is only reached for 4.5% of them[35].

Added to the NNP's focus on IYCF, the FMoH's National Mental Health strategy points to key issues linked to the lack of awareness of mental health in the population, the prevalence of intimate partner violence (mentioned several times during the qualitative study), the high level of stress for children's caregiver due to their gender role, and the impact of perinatal mental health problems. Indeed the strategy points that more than 1 in 10 pregnant women, and 1 in 20 postnatal women in Ethiopia suffer from undetected depression. Perinatal mental disorders negative impact on children's health in Ethiopia (e.g. increasing episodes of diarrhoea, interfering with initiation of breast-feeding and negatively affecting child cognitive and motor development). Adolescence pregnancy rate is 12%, sexual and reproductive health problems. Efforts to develop non-medical interventions for postnatal depression that can be integrated into the PHC system will be a high priority in Ethiopia. Maternal, new-born and child health (MNCH) is one of Ethiopia's priority health programmes, including immunization, integrated management of new-born and childhood illnesses (IMNCI), antenatal care and family planning. The four pillars of safe motherhood (Family Planning, Antenatal Care, Clean and Safe Delivery, Essential Obstetric Care),

[30] National Strategy for Infant and young child feeding, April 2004, Federal Ministry of Health, Family Health Department, Ethiopia.
[31] An analysis of trends and determinants of child undernutrition in Ethiopia 2000-2011, Ethiopia Strategy Support Programme research note 39, May 2015.
[32] EDHS, 2011.
[33] Baseline IYCF KAP survey in Moyale and Dire woredas of Borena zone, Oromya region, Ethiopia. CARE, February 2014.
[34] EDHS, 2011
[35] Baseline IYCF KAP survey in Moyale and Dire woredas of Borena zone, Oromya region, Ethiopia. CARE, February 2014.

were endorsed in the national Safe Motherhood Initiative and are implemented as major strategic directions under the leadership of the FMoH.).

3.5 HYPOTHESES FROM THE INITIAL WORKSHOP

3.5.1 Hypothesis A. "Low women's decision power"

Women's social status has been shown to impact on their own nutritional status and care, as well as their child's nutritional status primarily through affecting birth weight as well as her ability to provide appropriate care. [36]

Women's lack of empowerment is believed to be an important factor in the persistent prevalence of malnutrition. According to RFS, 13.33 % of women have low decision power[37].Nevertheless, compare to olden days, women are more involved in decision-making: they can at least discuss decisions with their husband even if at the end the husband makes the decision. In some cases, husbands can make decisions according to his wife's suggestion.

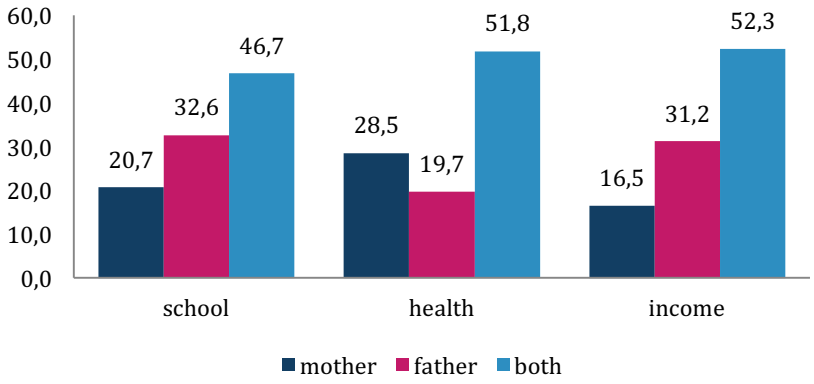


Fig. 6. Decision-making in households.

"Nowadays women have rights; they can discuss decisions with their husband. Men cannot take decisions without consulting their wife" (grand-mothers, Harnka Bule)

"In the past women were beaten, nowadays not so often. The men were really respected: the men were ordering and the women were obeying. Nowadays the women can try to convince their husband" (grand-mothers, Silala)

"Women are not considered, they have no properties, no rights, they are oppressed" (TBA, Midhaga)

[36] Smith L., 2003., The Importance of Women's Status for Child Nutrition in Developing Countries, Washington, DC: IFPRI

[37] According to Link NCA indicators guideline, a women is considered having low decision power if she cannot take alone or with her husband more than one decision (regarding schooling of children, medical consultation, household's expenses or timing to have another child).

3.5.2 Hypotheses B. "Women workload" and D. "Lack of quantity and quality of time spent with children".

High workload of women may contribute to negatively impact maternal and child nutritional status. When a mother has a high workload, she is less available for her children and it has an impact on feeding practices as well as on children's stimulation. Moreover, excessive energy expenditure in the absence of increased caloric intake can result in poor maternal nutritional status.

The risk factor survey found that almost ¾ of mothers feel they have too much work to adequately care for their children.

INDICATOR	SAMPLE	MEAN OR PROPORTION	LOWER CI 95%	UPPER CI 95%
Mothers who feel they have too much work to take care of their child	705	72.91	67.32	78.49

Tab. 12. Women workload indicator result.

The workload of women was further explored in the qualitative inquiry. In Borana culture, roles and responsibilities are well defined: women are responsible for all domestic-related chores, and there are shared responsibilities between men and women for livestock and farming.

Activity	Men	Women
Domestic chores		
House cleaning		X
Fetch water		X
Firewood collection		X
Food preparation		X
Children feeding		X
Clothes washing		X
Children bathing		X
House construction		X
House decoration		X
Livestock		
Fencing of cow enclosure ("Mona")	X	
Fencing of goat enclosures ("Dokoba")		X
Looking after moving animals	X	
Looking after animals staying in the village		X

Activity	Men	Women
Watering of moving herd	X	
Watering of animals staying in the village		X
Cleaning of cow enclosure ("Mona")	X	
Cleaning of goat enclosure ("Dokoba")		X
Grass collection (dry season)		X
Milking of animals		X
Animal health	X	
Livestock marketing	X	
Farming		
Ploughing	X	
Sowing	X	
Weeding		X
Harvesting	X	X
Transport of harvest from field to house (if no donkey available)		X

Tab. 13. Task sharing out between men and women.

We tried to estimate how many hours per day women were working during rainy and during dry season (Figure 7): it appeared that women work up to 16 hours during dry and 13 hours during rainy season, even if they are pregnant. Since the time taken to fetch water depends on the type and location of water source, the time spent for fetching water may be higher. During dry season, as the workload increases (additional tasks and higher distance to fetch water and collect firewood), women have to prioritize their work. They will make sure that they have collected grasses and fetch water for the animal staying in the village (young, lactating and sick animals), and some tasks will not be done regularly, in particular washing of clothes and bathing of children above 1 year.

"During dry season it is difficult, we have too much work, but animals are our properties, we get food and money from them, so we have to make sure that water and grass is always available for them" (mother in Silala)

Care practices depend to a great extent on the amount of time available for the caregiver to take care of the child. Women in the study area have very little time to take care of their children or of themselves. Since they have little time available they prioritize babies. Indeed, discussions with women highlighted that they consider that when a child is able to walk alone, s/he doesn't need much attention and can be managed by elders siblings (except for feeding, which is the responsibility of the mother' 'adult relatives or neighbours), so mothers focus their attention on babies. They usually try to breastfeed their child in the morning before starting their work and between two tasks.

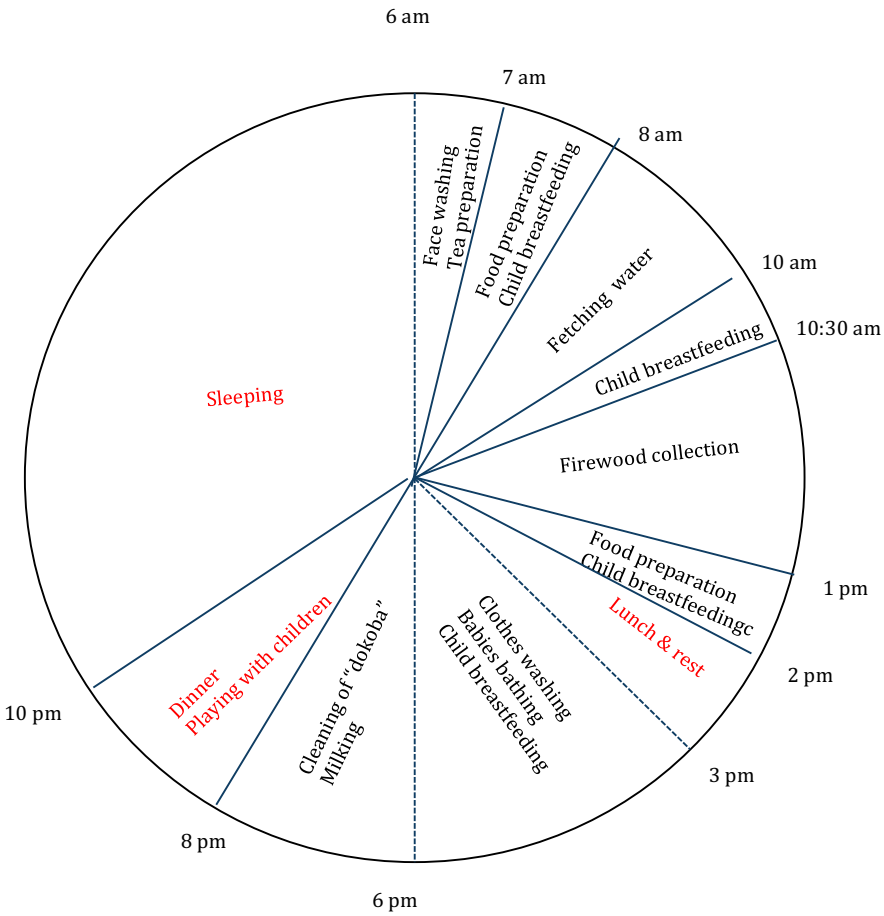
"We try as much as possible to be « alaka38 » but we have too much work and little time with the children" (mother, Midhaga).

"During day time it is difficult to spend time with child because we have too much work, but at night we have time before going to sleep" (mother, Midhaga)

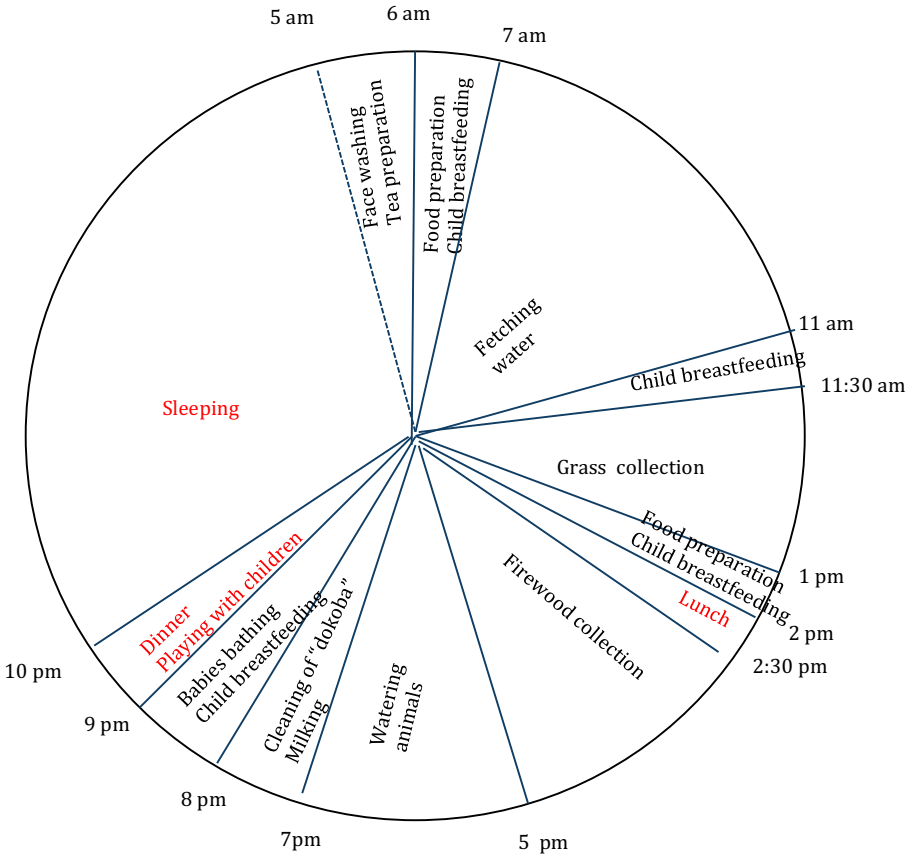
Since mothers have a high workload, at the end of the day they are weary and exhausted. Not only do they lack time to spend quality moments with their children, but they are also irritable and less patient.

"When I was pregnant I was really tired and I was irritable, when my child was shouting or crying, I beat him several times." (mother, Silala)

[38] A mother who is feeding her children properly, who play with them, who wash them everyday



RAINY SEASON



DRY SEASON

Fig. 7. Women activity clock during rainy and dry season.

In Borana, women use to take 7 weeks rest after delivery, it is the "ULMA": during this period women stay at home, they are not supposed to do any work but only to focus on the new-born. The parturient's relatives (elder daughter, mother-in-law, sister-in-law) will ensure domestic chores (food preparation, house cleaning, clothes washing, looking after small animals) and the other women of the village will take charge of fetching water collecting firewood. In Moyale woreda, the "ULMA" period sometimes lasts 40 days instead of 49, but the parturient is not supposed to work as well.

On average, 99.72% of women in the studied area took rest after delivery.

INDICATOR	SAMPLE	MEAN OR PROPORTION	LOWER CI 95%	UPPER CI 95%
AVERAGE REST AFTER BIRTH (IN DAYS)	705	48.86	48.66	49.06
WOMEN TAKING REST (> 40 DAYS) AFTER DELIVERY	705	99.72	98.68	100.76

Tab. 14. Rest after delivery indicators.

The Figure 8 presents the pathway by which mother's workload leads to an increased risk of undernutrition for child and women of child-bearing age.

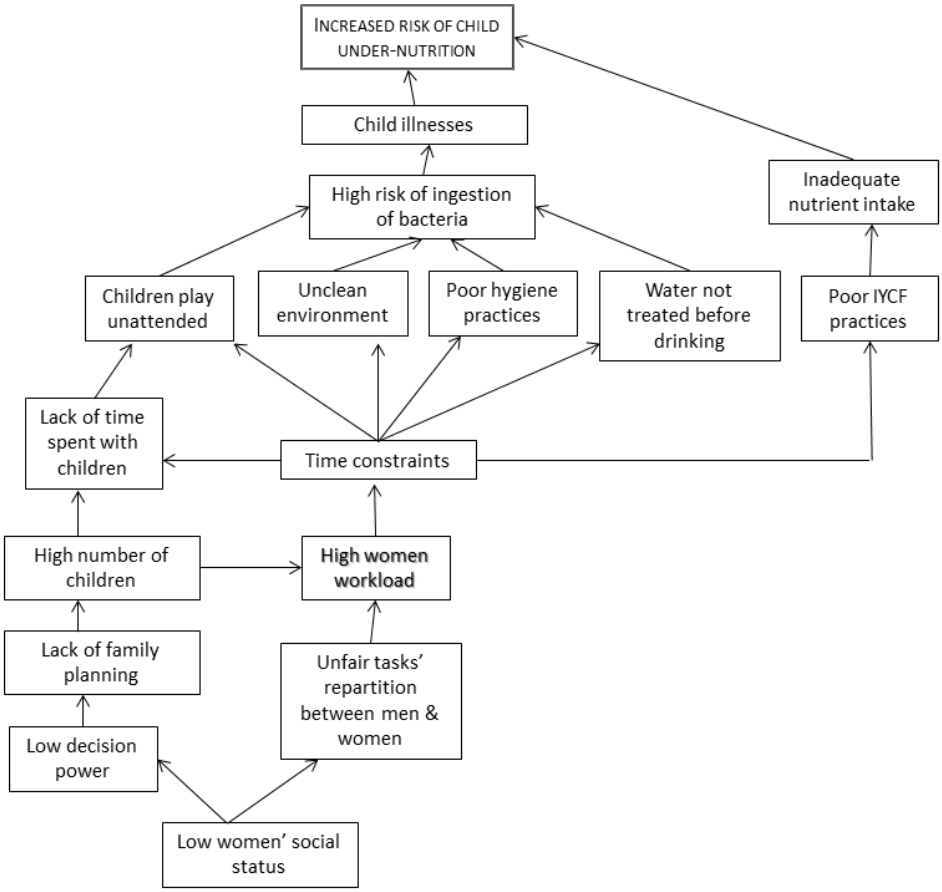


Fig. 8. Causal pathway of women' workload to undernutrition.

3.5.3 Hypothesis C. "Low maternal well-being"

"The link between maternal depression and her child's nutritional status may not be direct but there are mechanisms, such as lacking energy and will to take care of one's child and be responsive and stimulating, that could explain the child's lack of development and appetite.[39]"

As seen above, mothers have low decision power and a high workload, which can contribute to their low well-being. High household workload, poor women's empowerment or lack thereof and maternal mental health have all been shown to impact on a child's wellbeing. According to the RFS, 52.6% of the mothers are at risk of depression[40], and when asked if they felt supported, only 19% of them feel extremely supported (Figure 9).

[39] Link NCA Indicators guide, ACF, 2012.
[40] WHO5 index <13

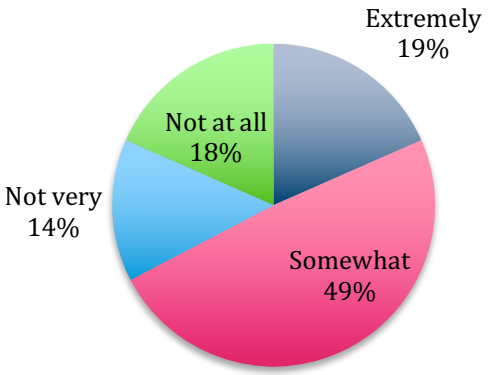


Fig. 9. **Perceived social capital.**

Support was not specified, and was down to the respondents own perceptions. However, social capital is thought to represent the quality and quantity of social relationships in a community on which the respondent can rely for support; this can be economic support also, receiving information, or other types of support.[41].

Quarrels were reported to be common in the all the villages. Common reason for arguments was livestock: because the wife does not keep the goats into their enclosure right away when the husband asks her to do so, or because some goats escaped from the vigilance of the woman.

"if a do a mistake, my husband will discipline me. My husband is right: like that I will not do again the same mistake" (mother, Midhaga)

"when my husband was alive, if he asked me to put the goats in their house and I didn't do it right away, he was beating me. Now I am widow, I have a friend[42], but nobody beat me anymore" (mother, Silala)

Since their childhood, girls know that they belong to their family and that they will become their husband's property when getting married: they will have to respect them and to listen to them even if they don't agree with them. In Borana culture, it is very shameful to have a rebellious wife and the man will be mocked by the community if he cannot "control" his wife.

Moreover, female excision, or female genital mutilation (FGM) is widely practice in the area (all the women met said they were excised) even if it is forbidden by the government: in Borana culture, all the girls have to be excised to ensure their "marriageability", *"if a girl is not circumcised, it is shameful for her and for her family, and she will not have husband (mother, Dambi Hora").*

According to Borana beliefs, if FGM is done, the pain of delivery will be less. Moreover, they assume that if excision is not done their sexual needs will be high.

FGM has short and long term effect on women health, and is a risk factor for the infant. "*A recent WHO-led study showed that FGM is associated with increased risk for complications for both mother and child during childbirth. There are significantly higher death rates (including stillbirths) among infants born from mothers who have undergone FGM than women with no FGM[43]*". FGM can also have psychological

[41] Sujarwoto et al., Child Health and Mothers' Social Capital in Indonesia through Crisis, 2011. Available at SSRN: http://ssrn.com/abstract=1856029
[42] In Borana culture, widows can have a partner called "friend".
[43] An update on WHO's work on female genital mutilation (FGM), Progress Report, WHO, 2011.

consequences: stress of the procedure may cause loss of trust and confidence in caregivers for young girls. Women may suffer from stress disorders, feelings of anxiety and depression. Psychosexual problems and/or sexual dysfunction may also contribute to marital conflicts. "*Women who have undergone FGM may be more likely than others to experience psychological disturbances (psychiatric diagnosis, suffer from anxiety, somatization, phobia and low self-esteem)*[44]".

Nevertheless, when we asked the women if circumcision had an impact on their health and on their well-being, all of them said no. This practice is so deeply fixed in their tradition and beliefs that they do not think about, see or voice its negative effect. FGM is promoted by grand-mothers and there is a person in each village, the" QABANQABDU", dedicated to this practice.

« The circumcision is painful during several days, you can bleed a lot and sometimes girls die but it is normal to do it. In our culture you have to be circumcised if you want to get married. If you are not, you can be rejected from your community » (grand-mother in Dambi Hora).

It seems there is a slight difference in the way FGM is practices between the villages in Miyo woreda and the villages of Moyale woreda surrounding the territory of Gabra tribe. In Harnka Bule village, FGM is practiced in the "Gabra style": once the cutting is done, the legs of the girl are attached together for one week, which suggests infibulation, which increases the risk of infection since the blood cannot go out easily. The risks of complications during childbirth for mother and child are much higher with infibulation

3.5.4 Hypothesis E. "Low educational opportunities"

A cross country analysis found that parental education, particularly of the mother, is linked to child nutrition and health[45]. Educated mothers have higher knowledge on proper health, hygiene, nutrition and proper child-care practices related to breastfeeding and complementary feeding. One study suggested nutrition' knowledge may have more impact on child' nutritional status than on formal education of the mother[46] [47]. However, knowledge cannot do so much to improve practices if the household don't have resources, or specifically sufficient foods[48].

The RFS shows that only 12% of the interviewed mother went to school.

"In the past (40 years ago) girls were not allowed to go to school because parents thought they could get pregnant since being mixed with boys. Now there are more schools and the government is pushing the parents to send their children to school." (grand-mother, Silala)

Even if the situation is changing slowly thanks to schools' construction and awareness done by government, girls have lower access to schooling than boys: indeed, girls are supposed to support their mother in the domestic tasks in order to relieve them a bit and to prepare themselves to become a housewife. In the villages visited it was common to see little girls taking care of their younger sibling, grinding maize and carrying water.

[44] Ibid.
[45] Smith L. and Haddad L.J., 2000. Explaining child malnutrition in developing countries, a cross-country analysis. IFPRI, Research Report III.
[46] P Glewwe and J Hanan Jacoby, Student achievement and schooling choice in low-income countries: Evidence from Ghana, Journal of Human Resources, 1994
[47] LY Appoh, and K Sturla, Maternal nutritional knowledge and child nutritional status in the Volta region of Ghana, Matern Child Nutr, 2005
[48] Bhutta et al., What works? Interventions for maternal and child undernutrition and survival, Lancet, 2008

"You cannot send all your children to school because you need some of them to look after the animals" (grand-mother, Silala)

In Silala village we were told that a teacher was coming to the village to give evening lessons to the boys who are looking after the animals during day time.

The Figure 10 shows the pathway by which low educational opportunities lead to an increase risk of child undernutrition.

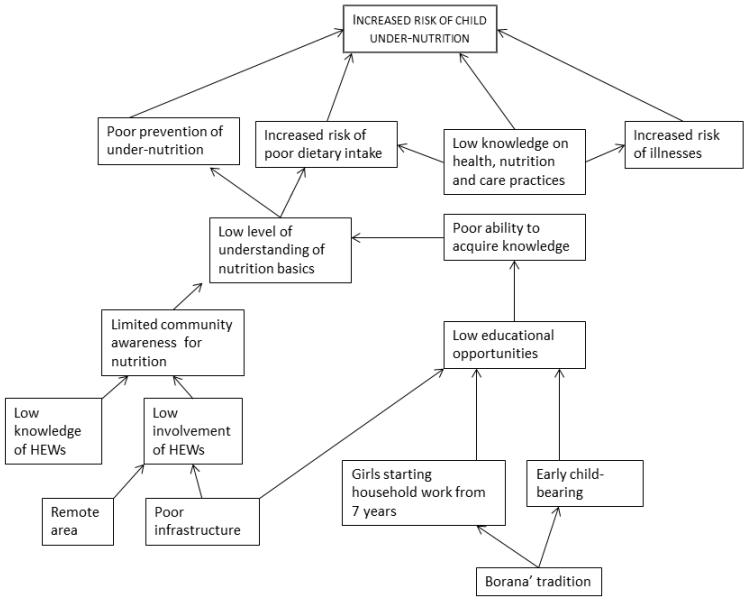


Fig. 10. Causal pathway of low educational opportunities to undernutrition.

3.5.5 Hypothesis F. "Low women nutritional status prior to pregnancy"

Poor maternal nutrition increases the risk of poor child growth *in utero* as the child is completely dependent upon the mother's nutritional stores. Poor pre-pregnancy stature and weight, and poor gestational nutrition have been shown to increase the risk of in –utero growth retardation (IUGR) and child underweight.[49] Poor maternal nutrition status may be due to inadequate food intake, illness or high energy expenditure.[50] Additionally, one study found that severely underweight children were more likely to have a mother who was undernourished.[51] .

The MUAC of mothers of child-bearing age was measured during the Risk Factor Survey: 10.32% of them were malnourished (table 15).

[49] D Alasfoor, Determinants of Persistent Underweight among Children, Aged 6-35 Months, after Huge Economic Development and Improvements in Health Services in Oman, J Health Popul Nutr, 2007
[50] U. Ramakrishnan Effect of Women's Nutrition before and during Early Pregnancy on Maternal and Infant Outcomes: A Systematic Review, Paediatric and Perinatal Epidemiology, 2012
[51] B Nahar et al., Risk Factors Associated with Severe Underweight among Young Children Reporting to a Diarrhoea Treatment Facility in Bangladesh, J Health Popul Nutr, 2010

INDICATOR	SAMPLE	MEAN OR PROPORTION	LOWER CI 95%	UPPER CI 95%
MOTHER'S NUTRITIONAL STATUS	688			
NORMAL (MUAC ≥ 22 CM)		89.10	86.76	91.43
UNDERNUTRITION (MUAC <22 CM)		10.32	8.04	12.60
SEVERE WASTING (MUAC < 19 CM)		0.15	-0.14	0.43
EXTREME WASTING (MUAC < 16 CM)		0.44	-0.06	0.93

Tab. 15. Nutritional Status of Women of Child Bearing age (15-49 years) as measured by Mid-Upper Arm Circumference.

3.5.6 Hypothesis G. "Low mother's food intake during pregnancy / lactation"

While it is recommended to increase food intake, in quantity and quality, during pregnancy and lactation to meet the particular needs during these phases, the RFS shows that a majority of women (54.78%) report to eat less during their pregnancy (table 16).

INDICATOR	SAMPLE	%	LOWER CI 95%	UPPER CI 95%
Food intake during pregnancy	**688**			
more than usual		22.11	3.32	15.30
less than usual		54.78	3.55	47.50

same than usual		23.11	2.40	18.18

Tab. 16. Food intake during pregancy.

During community discussions, most of the mothers said they force themselves to eat less during pregnancy in order to have a small baby and to facilitate the delivery. Some mothers assumed that *"there is not enough space for the baby and for the food so we have to eat less for the baby to grow".*

It appeared that in Borana culture some food items are also forbidden:

- for pregnant women : "ARERA" (cow milk mixed with water) which is believed to give a big baby,
- for pregnant and lactating women : "OKOTE OBATI" a traditional meal made of crashed maize without skin mixed with beans, prepared for the delivery ceremony. This meal is forbidden for boys and men, so pregnant mothers, who don't know the sex of the baby to be born, and mothers breastfeeding a boy, cannot eat this meal.

During the "ULMA" period, women eat a special food, "ULMA SAGALE", which is a soft food prepared with ground maize and haricots beans.

Most women do not see any link between their food intake during pregnancy and their nutritional status, or between their nutritional status and the one of the baby to be born.

"Even if we eat little during pregnancy the baby will be healthy » (mother, Midhaga)

"If the newborn baby is small, we will give him cow milk and he will become fat and strong » (Traditional birth attendant, Dambi Hora)

"It is better to have a small baby and if the mothers feed him/her well he will become big" (grand-mothers, Silala).

Very few mothers eat more and try to diversify their diet during pregnancy: they are mainly the ones having relatives in Kenya who informed them about the importance of food diversification and who managed to afford vegetable and fruits.

« When the mother is eating enough food, the baby is healthy » (Traditional Birth Attendant in Silala)

"You can be affected by malnutrition at any age, but the most affected are lactating women, especially during dry season because she drink less milk because not there, and pregnant women because of the tiredness she will become weak if she has not food."(head of village, Silala)

Figure 11 presents the pathway by which low mothers' food intake during pregnancy and lactation leads to an increased risk of women and child undernutrition.

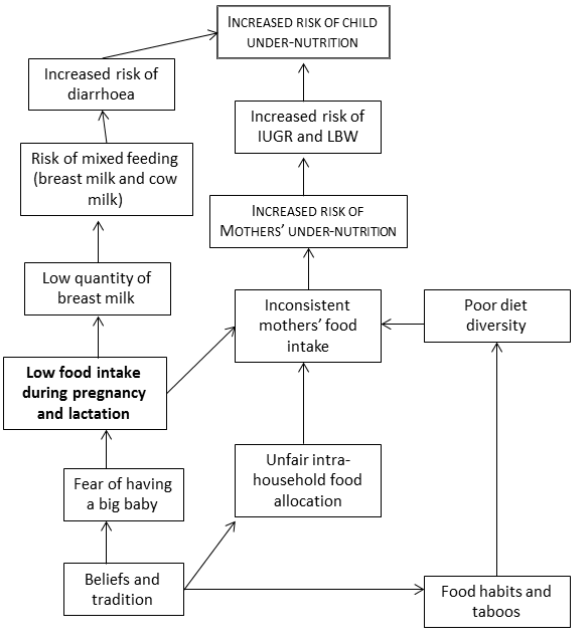


Fig. 11. Causal pathway of low mothers' food intake during pregnancy and lactation to undernutrition

3.5.7 Hypothesis H. "Lack of care during pregnancy"

In total 86.53% of mothers reported to have seen a health professional (doctor, nurse, midwife or HEW) for ANC during their last pregnancy, and more than half of them saw it at least 4 times.

INDICATOR	SAMPLE	MEAN OR PROPORTION	LOWER CI 95%	UPPER CI 95%
ANC				
Caregivers who saw a health professional	705	86.53	82.82	90.23
At least 4 times	610	54.61	48.79	60.43

Tab. 17. Ante-Natal Care attendance.

Discussions highlighted that pregnant women were not going to health facilities (either HP, HC or hospital) because they were aware of the importance of ANC but because they felt sick or fall down and then went for a check-up. The ones going several times for ANC attendance were women who were diagnosed anaemic during their first visit to the HC and who were asked to take iron and vitamins supplementation and were

asked to come back for follow-up. The data from table 17 have therefore to be taken with caution.

3.5.8 Hypothesis I. "Low birth spacing / lack of family planning"

Short births intervals limit the amount of time that mothers have to recover from the nutritional burden of pregnancy and lactating. If a mother's reserves have been depleted, the succeeding child is at risk of foetal malnutrition and a compromised gestational period. Moreover, young children, born close together, might have to compete for food, maternal care, attention or other resources. Short subsequent birth intervals prompts weaning of the first child and reduction in the volume of breast milk consumed for that child. Both factors can make the first-born child more vulnerable to infection and nutritionally disadvantaged[52].

In Borana culture there is a traditional family planning: when the mother is breastfeeding a child, the couple will not sleep together to avoid having any sexual relation. They assume that if a woman is breastfeeding and has a sexual relation, her breastmilk will be contaminated and the child will become sick. Since women are used to breastfeeding for a long time, men have "friends" within or outside the village to satisfy their needs[53]. Nevertheless, if a man decides that it the time to have another child, he will ask his wife to stop breastfeeding. The wife can try to convince her husband to wait but she will not make the final decision.

The RFS shows that 91.13 % of women use this systems and the remaining use "modern" family planning. Among 8.87% of women using modern contraception, 75.41% use injectable.

INDICATORS	SAMPLE	MEAN OR PROPORTION	LOWER CI 95%	UPPER CI 95%
Current use of family planning	**688**			
traditional FP		91.13	88.33	93.94
modern FP		8.87	6.07	11.67
Modern contraceptive means	**61**			

[52] Preceding birth intervals and child survival: searching for pathways of influence., J.T.Boerma and G.T. Bicego, Studies in Family Planning, 1992 Jul-Aug;23(4):243-56.

[53] This behaviour is well known in the area and socially accepted but still hidden. If a man gets his friend pregnant and if this woman is already married, the man will have to deal with the husband and generally a gift of one or two cows will suffice to settle the inconvenience.

INDICATORS	SAMPLE	MEAN OR PROPORTION	LOWER CI 95%	UPPER CI 95%
injectable		75.41	62.22	88.60
implants		16.39	4.79	28.00
pills		8.20	-0.48	16.87

Tab. 18. Family planning indicators.

Several women told us that they were not willing to take modern contraception because they fear the side-effects :

"if you take injectable, you will always have headache and will be tired. You will not be able to work normally" (mother, Midhaga)

"with the pills you will need to eat a lot, it is a problem when there is little food" (mothers, Dambi Hora)

"two years ago, when a woman was taking family planning, she was stopping breastfeeding her child. Now, women continue breastfeeding and some of them have also sexual relation with their husband" (HEW, Dambi Hora).

Usually Borana couples have their first child within the year following their marriage. While most women said the best age to be married was 20 years and above for girls and 30 years for boys, the RFS show that the average age to have the first child is 18.14 years. The qualitative inquiry found that women typically get married age 15-17, though sometimes as young as 12, reportedly depending on when a girl reaches puberty. Women agree to say that girls under 15 years old are not able to have a child because they don't know how to care for babies properly: *"they can forget to feed the baby, they don't know how to hold him".* The couple of young people having a child are called "RUSISADE" : the father is young, the mother is young and the baby is young. It is assume that the first child of this couple will not be well cared for, and the mother-in-law will assist them.

"If the daughter-in-law is too young (less than 15 years), the mother-in-law will spend the night nearby the baby to make sure nothing happens to him" (grand-mothers in all the villages).

When there is a delay of several years between the marriage and the first child because the couple cannot conceive, the couple is called "*GANEDALE*". *"If your are ganedale it puts the blame on you because everybody assume it is the woman who has a problem since God doesn't give a child" (mother, Dambi Hora).*

"Sometimes a woman cannot get pregnant, then the husband marries another woman. If the second wife gets pregnant, after delivery her baby will be given to the first wife and she will take care of him as her own child which will help her to become fertile" (mother, Dami Hora)

The discussions highlighted that in Borana culture, it is well perceived to have a lot of children since you have children depending on God's will, preferably boys because :

- *"boys will always stay in their family while the girl will belong to another family when she will get married" (mothers, all villages).*

- *"boys, when adults will look after the animals and will help the parents in the farm, while the girls are leaving and don't belong anymore to the family" (grand-mother Midhaga)*
- *"it is better to have a lot of children in case some of them die although it is good to have good birth spacing of 2 years" (TBA, Dambi Hora).*

We noticed that the birth interval was shortened when the last child born was a girl: whereas the birth interval between a boy and his young sister can be up to 3 years, the one between a girl and her young brother was between 1 and 1 ½ years. This has negative impact on the girls' breastfeeding duration since the mother will stop breastfeeding her to have another child.

Figure 12 shows the pathway by which of low birth spacing / lack of family planningleads to an increased risk of child undernutrition

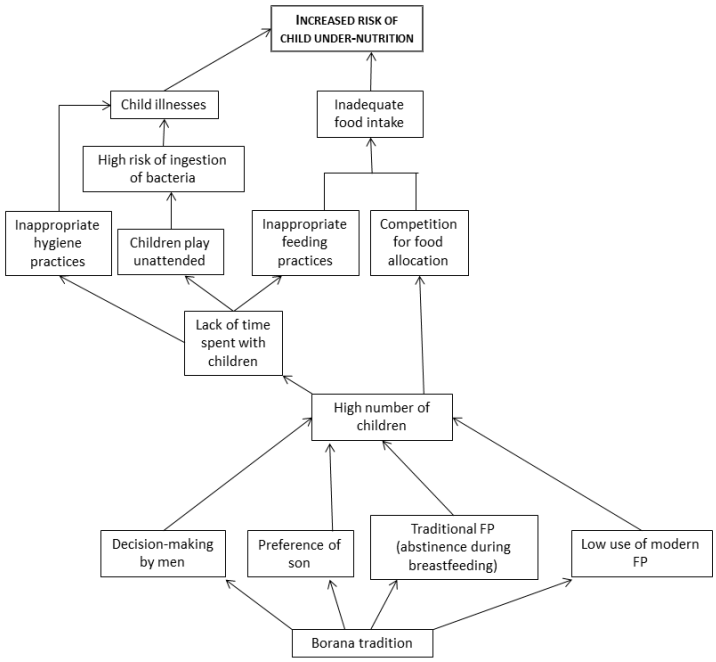


Fig. 12. Causal pathway of low birth spacing /lack of family planning to undernutrition.

3.5.9 Hypotheses J. "Low rate of exclusive breastfeeding under 6 months" and K. "Practice of prelacteal feeding".

Ethiopia follows WHO recommendations on breastfeeding practices: breastfeeding should be initiated within the first 1-hour of life; an infant should be exclusively breastfed for the first 6-months of life; and, at 6 months complementary foods should be introduced whilst continuing to breastfeed to 24-months. Exclusive breastfeeding under 6 months has been shown to display a protective effect on child's health, in particular against diarrhoea incidence, prevalence, hospitalizations, diarrhoea mortality and all-cause mortality.

In total, 94.68% of sampled children age 0-24 months had ever been breastfed. The survey found very high levels of early initiation of breastfeeding, with 86.6% of 0-23

month old children receiving breast milk immediately after birth. Rates of exclusive breastfeeding are low, with 55.74 % of children under 6 months old exclusively breastfed (table 19).

Indicators	Sample	Mean or proportion	Lower CI 95%	Upper CI 95%
Child 0-24 months ever breastfeed	**338**	94.68	92.49	96.86
Early initiation of BF	**338**	86.69	78.02	95.35
Exclusive breastfeeding	**61**	55.74	40.73	70.75
Continued breastfeeding at 1 year	**62**	100.00	100.00	100.00
Continued breastfeeding at 2 years	**60**	85	75.698	94.302

Tab. 19. Breastfeeding indicators.

Evidence from the qualitative enquiry shows that the practice of prelacteal feeding is widespread, which is contradictory with the results of the RFS. This can be explained by the fact that the promotion of breastfeeding by HEW is widely done and since the enumerators only spent one hour with each mother, they just record the mother's answer without going in depth.

In Borana culture, a new-born baby boy will be given "KUMBI" (medicinal herb) with water and after he will be given cow milk. A new-born girl will be given cow milk. Both will be given cow milk (2 cups/day for a boy, 1 cup for a girl) until their umbilical cord falls, and after, the mother will start breastfeeding the child. They believe that cow milk will give strength to the baby since *"breastmilk is like water".* Moreover, some mothers believe that *"the stomach of the baby is not prepared to receive breastmilk just after the birth".*

Women are able to breastfeed exclusively their child during the "ULMA", period of 49 days rest after delivery. Nevertheless, before the end of the "ULMA", the mother will start giving cow milk to her baby in prevision of the work period.

"After the ulma, I will not be able to breastfeed my child often so he has to be used to cow milk" (mothers, Midhaga, Dambi Hora, Silala).

"I have a lot of work, I am leaving at 7 in the morning and I come back at 1 or 2 in the afternoon. I breastfeed my child before leave the house but he cannot stay without food until I come back, so I leave cow milk in the house and the neighbor will give him cow milk" (mothers, Midhaga, Dambi Hora).

"If the children are breastfeed long time and don't drink cow milk, they will become weak" (Grand-mother, Midhaga)

It seems that the promotion of breastfeeding is largely done by health personnel but the message spread is incorrect: we were told several times in different villages that the HEW or the nurse in the HC advise mothers to give water to breastfed children under 6 months, or advise anaemic mothers to stop breastfeeding her baby.

"I went to the health post and the HEW told me that when I breastfeed my baby I have to give him water also" (mother, Midhaga).

"One day when I was collecting firewood in the mountain, I felt down. I went to the HC and the nurse told me that I was anaemic, she told me that I have to stop breastfeeding my baby. I listen to her and few weeks after my baby become sick. The HEW who comes sometimes told me that my baby was malnourished and she gave him plumpy nut" (mother, Dambi Hora).

The duration of breastfeeding is high: 100% of mothers continued breastfeeding at 1 year, 85% at 2 years, but it seems it has decreased compare to past.

"In the olden days, the boys were breastfeed up to 2 years only and the girls up to 4 years. We were not educated and we thought that a boy breastfed more than two year, when adult, could not walk long distance without eating often. "(Grand-mothers, Silala)

If unfortunately a couple has sexual relations while the woman is still breastfeeding, Borana assume the breast milk will be contaminated and the baby will get sick, so the child will not be breastfeed anymore.

"If our first baby die, we will not breastfeed the second because our breast milk will be contaminated"

Figure 13 presents the pathway by which low exclusive breastfeeding under 6 months and practice of prelacteal feeding lead to increased risk of child undernutrition.

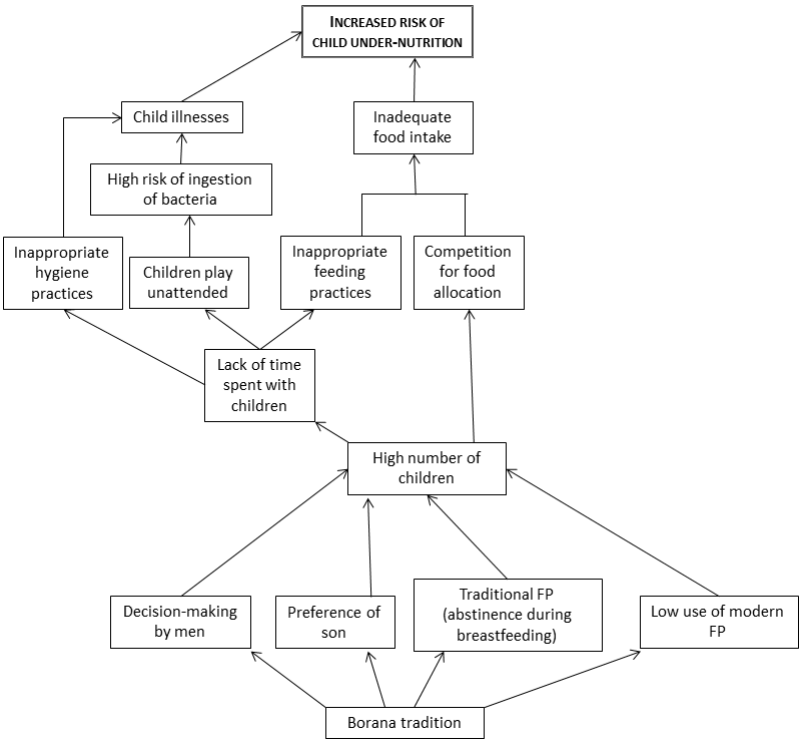


Fig. 13. Causal pathway of low exclusive breastfeeding under 6 months and practice of prelacteal feeding to undernutrition.

3.5.10 Hypothesis L. "Inappropriate complementary feeding practices"

Proper complementary feeding is defined as "timely introduction of safe and nutritional foods in addition to breastfeeding[54]" Appropriate practices of complementary feeding are crucial from 6 to 24 months for healthy growth and development, impacting on both weight and height gain[55].

The RFS shows that only 25.53% of children had timely introduction of solid, semi-solid or soft foods (table 20): these children are given porridge made with maize flour with cow milk. Since the HEWs are promoting consumption of eggs, some families are giving them to child even if in Borana culture eggs are forbidden: *"eggs come from birds and birds are dirty so we cannot eat them"*. Most of the children are given cow milk in addition to the breast milk until they have their front milk teeth and then they will be given family food.

Compare to the EDHS, less children are fed appropriately (IDDS ≥ 4 groups), and less children have adequate meal frequency.

INDICATORS	SAMPLE	MEAN OR PROPORTION	LOWER CI 95%	UPPER CI 95%
Complementary feeding (6-8 months)	47	25.53	11.81	39.26
IDDS (≥ 4 groups)	270	0.37	-0.383	1.124
Meal frequency (6-23 months)	276			
adequate		15.22	8.98	21.45
inadequate		84.78	78.55	91.02
Responsive feeding (child 24-36 months)	280	cf. charts		

Tab. 20. Complementary feeding indicators.

[54] A. Imdad, MY. Yakoob, & ZA. Bhutta, Impact of maternal education about complementary feeding and provision of complementary foods on child growth in developing countries, BMC Public Health, 2011
[55] KG. Dewey, & S. Adu-Afarwuah, Systematic review of the efficacy and effectiveness of complementary feeding interventions in developing countries, Matern Child Nutr, 2008

Responsive feeding stimulates and develops a child's appetite.[56] The RFS showed that 66.4% of children under 2-years were helped to eat. If the child refuses to eat, most of the mothers (77%) frighten them *"if you don't eat, the dog will come and eat you"* or threat them *"if you don't eat I will bite you".* 17% of mother don't do anything, and 6% force them.

As seen in § 3.1. Error! Reference source not found., the prevalence of malnutrition among boy is higher than among girls : this seems to be linked to the prelacteal practices (giving water and KUMBI at birth and then cow milk to baby boys) and inappropriate feeding practices (late introduction of complementary food, inadequate meal frequency).Since boys are preferred in Borana culture, they are given more cow milk than girls since their birth, increasing the risk of diarrhoea and infections.

3.6 RELATION WITH OTHER SECTORS

There is a link between hypothesis B and WASH sector : women have so many domestics chores that they cannot bath their children as much as they wish. Moreover, the water source being far and the quantity transported daily by women covering only drinking and cooking water needs, the hygiene is not a priority. Finally, the workload of women being high, the boiling of water to make it safe may sometimes be skipped.

"Babies are often dirty because they always do pee and defecate, we have to wash them often. The children (the ones able to walk) can stay without taking a bath several days , we usually wash them once a week."

4/ HEALTH SITUATION

4.1 DESCRIPTION OF HEALTH SITUATION

"The Health Sector Development Program (HSDP) is a key component of the Growth Transformation Plan[57] and its primary objective is to improve the health of the population through the promotion of preventive, curative and rehabilitative health services. The HSDP prioritizes maternal and newborn care, and child health, and aims to halt and reverse the spread of major communicable diseases such as HIV/AIDS, TB, and malaria. The Health Extension Programme serves as the primary vehicle for the prevention, health promotion, behavioural change communication, and basic curative care. The programme is based on expanding physical health infrastructure

[56] Bentley et al., Responsive Feeding and Child Undernutrition in Low- and Middle-Income Countries, JN, 2011
[57] "The Growth and Transformation Plan (GTP) 2011-2015 has been designed to maintain the rapid and broad-based economic growth enjoyed by Ethiopia in the recent past and eventually to end poverty" (MOFED, 2010).

and developing Health Extension Workers who provide basic and essential promotional, preventive health intervention services in rural communities in three primary areas: hygiene and environmental sanitation, diseases prevention and control, family health services[58]."

A lack of health care services is highlighted by UNICEF as one of the main underlying causes of disease, which in turn affects child nutrition. The proportion of births assisted by a skilled attendant (including doctor, nurse or midwife) are among the lowest in the country with 8.0% in Oromia Region, and the percentage of LBW (≤2.5 Kg) is 12%.

According to data received from Miyo and Moyale health offices, the top causes of morbidity in children under five are: pneumonia, diarrhoea, malaria, ARI and skin infection. The RFS show that the proportion of children with ARI in the past 2 weeks was 14.26%, and the proportion of children with diarrhoea was 10.34%. Such infections have a cyclical relationship in which poor nutrition compromises immune function and predisposes children to infection, further exacerbating poor nutrition.

4.2 HYPOTHESES FROM THE INITIAL WORKSHOP

4.2.1 Hypothesis M. "Low access and quality of health facilities and reliance on traditional medicine"

A lack of health care services is highlighted as one of the main underlying causes of disease, which in turn affects child nutrition. Ante-Natal Care attendance and barriers to access were explored as part of the risk factor survey with relation to this hypothesis.

The RFS shows that the main barrier from going to the health facilities (HC/HP) is the lack of money (35%) followed by the lack of transportations means (18%).

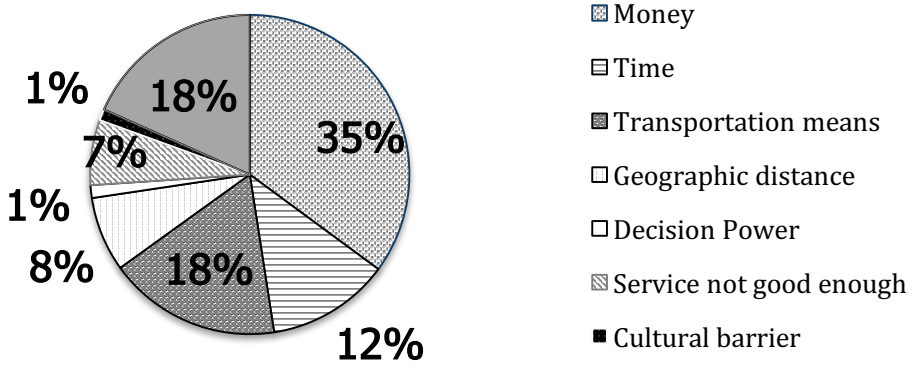


Fig. 14. Barriers from going to the health center.

In Borana culture, women should not be examined by a male health staff. Since most of the doctors in the HC are men, women are reluctant to go to the HC.

[58] Ethiopia Mini Demographic and Health Survey, CSA, 2014.

Among the visited villages, only one (Dambi Hora) had a health post, the others were between 30 min to 1 hour walk from the nearest HP. Even is the HP is not far, most villagers prefer to go to the HC, hospitals or clinics, since HP only do preventive activities. During the qualitative enquiry, most of women said they preferred to go to private clinics, even if it is more expensive, because in the HC the doctor is often absent, there are only nurses who *"are not professional persons" (mother Midhaga),* and there is a problem of medicine availability.

« It is difficult to go to the HC : you have to pay for a motorbike to go there, its cost 60 ETB per trip, then you will have to wait longtime because the queue is big and you are not sure to see a doctor. If you are asked to buy medicine, you will have to go to the chemist because there is no medicine in the HC." (mother, Midhaga).

Moreover, women having relatives in Kenya or leaving near the Kenya border prefer to go to Kenya when they have health problems because they assume the quality of health centers is better there.

Discussions highlighted as well that depending on the type of disease, villagers go to see the traditional healer ("CHIRESA") or go to health facility. For example, if a child has a common cold, a disease due to a bad spirit, or "QORSA[59]", s/he will be brought to the traditional healer who will treat him with medicinal herbs according to the moon cycle. If the child is brought to the HC and his health is not improving, he will be brought to the traditional healer as well.

In one community, it was reported that for health issues they rely on "AYANA", which is a person who "pray full night to cure the sick persons from bad spirits" and acts as a traditional healer.

Women are supposed to deliver at HC and awareness messages are, theoretically, spread in the villages. A system of on-call ambulance is implemented: the expectant mother has to call the ambulance, which will come to pick her up and drop her for free in the nearest HC.

"Government is asking women to go to HC to deliver, now I have little job in this village" (TBA, Midhaga)

"The ayana advises women not to go to the health center to deliver and she encourages people to have a lot of children because family planing interfers with God creation" (mother, Harnka Bule)

It was surprising to hear that in one village not far from the HC women deliver at home, while the ones from villages far from the HC go to the HC for delivery. This can be linked to the awareness given by HEWs in the villages : we noticed that in the villages where the HEW was reported to be not present often, the awareness of mothers (regarding delivery, feeding practices, hygiene) was low compare to the other villages. The problem of network was also reported : *"even if you want to follow the recommendation of HEW it is difficult because you want to call ambulance and there is no network" (mother, Midhaga).*

"I know that we are told to go to deliver at HC but sometimes the work starts before the ambulance arrive in the village, so I have to help the mother" (TBA, Dambi Hora).

In two villages we were told that the women have to pay penalties if not going to deliver at the HC, and it seems that one woman paid a penalty of 500 ETB to the HEW because she delivered at home.

[59] "*Qorsa*" : there are two types : one frequent but not serious which is a disease frequent for children under 5, which symptom is a swelling of the genital organs; one very rare but serious where the bones of the head are not joined beyond the fontanel.

4.2.2 Hypothesis X. "Low level of understanding of nutrition basics"

This hypothesis was proposed by technical experts during the initial workshop.

Nutrition, health and education (nutrition knowledge or formal education) are interrelated. In order to improve the nutrition of women and children under two years, the government of Ethiopia has incorporate the Essential Nutrition Actions (ENA) package into his Public Health program.

ENA is an "action-oriented" approach to expand the coverage of seven affordable and evidence-based actions to improve the nutritional status of women and children. The seven ENAs are:

- Exclusive breastfeeding for children 0-5 months
- Adequate complementary feeding for children 6-23 months with continued breastfeeding for at least 24 months
- Adequate nutritional care of the sick and severely malnourished child
- Adequate nutrition for women
- Prevention of vitamin A deficiency for women and children
- Prevention of anemia for women and children
- Prevention of iodine deficiency for all members of the household

"ENA takes advantage of key contact points at critical stages in the lifecycle to deliver these interventions so that the nutritional status of women and children improve. These contact points are: pregnancy, delivery and early neonatal consultations, Postnatal and family planning (FP) contacts, Immunization contact, Well child visits, including growth monitoring and promotion, Sick child visits, especially during and just after illness[60]"

At health facilities, ENAs should be carried out at all contacts with pregnant and lactating women and their children. Outside facilities in the community, follow-up of mothers and children and support to community workers and groups are key.

The qualitative enquiry highlighted that there was a low level of understanding of nutrition basics by mothers: the practice of exclusive breastfeeding is not widespread, they practice prelacteal feeding, complementary feeding practices are not properly done, they have no idea on what is nutritious food. This can be explain by : i) the fact that most of the mothers were not educated, ii) the presence of HEWs is not effective in all the village, iii) messages disseminated by health personnel (either HEWs in the villages or nurses/doctors in the health facilities) are sometimes not correct.

4.3 RELATION WITH OTHER SECTORS

Hypothesis X has a direct impact on the MHCP sector, in particular on IYCF practices and care for women.

[60] FANTA, 2008. Review of incorporation of Essential Nutrition actions into Public Health Programs in Ethiopia.

5/ WATER, SANITATION AND HYGIENE

5.1 DESCRIPTION OF WASH CONTEXT

"The underlying causes of undernutrition are poor sanitary and hygiene conditions coupled to a lack of access to safe water. This causal link may be expressed directly, with immediate consequences on people's health, or indirectly, creating a long-term risk to people's nutritional status. The process works both ways: poor nutritional status reduces immunity and weakens the body's natural defences (skin,intestinal membranes), creating a predisposition for infections (such as diarrhoea) and entrenching undernutrition by reducing intestinal absorption.(…) The lack of decent sanitation, satisfactory hygiene conditions and access to safe water are among the principal factors leading to a deterioration in people's nutritional status, since they pave the way for the development of intestinal ailments, limit the absorption of nutrients, delay growth and reduce the effectiveness of oral treatments. (…) Vulnerability to enteric infections (associated with lower immunity that may be caused by nutritional status) leads to greater vulnerability to other diseases such as pneumonia (it is estimated that the two are associated in 26% of cases)[61]".

Water, sanitation and hygiene practices, known to have effects on nutritional status, are poor in Ethiopia, and thus targeted for improvement. Evidence shows that children who live without clean drinking water, adequate sanitation and hygiene don't grow as well as children who do[62]. "Poor water and sanitation are both associated with a higher stunting prevalence, but differences are found across age groups split at the age of two years. Lack of sanitation, represented by no toilet facility, has a greater impact on HAZ of the children less than two years, while poor water source has a bigger effect on HAZ of children two years and older[63]". In a recent evaluation, conducted in the four big regions (Amhara, Oromia, SNNPR and Tigray), one-third of children observed were in contact with animal faeces and 90% were in close proximity to faecal matter[64]. An evaluation of association of exposure to poultry faeces and child undernutrition found increased stunting among children in households with poultry raised indoors[65].

According to EDHS, 41.7% of Ethiopians in rural area are using any improved source of drinking water and 90.6 % are using non-improved sanitation facilities. The burden of collecting water predominantly falls on women who in some cases may travel long distances to fetch water each day. This burden of fetching water inhibits women and

[61] ACF, 2014. Briefing Paper : Greater investment in water, sanitation and hygiene is key to the fight against undernutrition.
[62] Beyong malnutrition : the role of sanitation in stunted growth, Environmental Health Perspectives, Vol 12, N11, November 2014.
[63] FMoH/UNICEF/EU Situation Analysis of the Nutrition Sector in Ethiopia: 2000-2015. Ethiopian Federal Ministry of Health, UNICEF and European Commission Delegation. Addis Ababa, Ethiopia 2016
[64] ENGINE, WASH Practices in Rural Households in Amhara, Oromia, SNNP and Tigray Regions, T.M. Group, Editor. 2014.
[65] Headey, D. and K. Hirvonen, Exploring child health risks of poultry keeping in Ethiopia: Insights from the 2015 Feed the Future Survey, E.R.N. 43, Editor. 2015, IFPRI.

girls involvement in other activities such as education, income generation and other social issues[66].

5.2 HYPOTHESES FROM THE INITIAL WORKSHOP

5.2.1 Hypothesis N. "Inadequate hygiene practices in the household."

Poor hygiene practices can negatively impact child nutritional status due to exposure to pathogens, which may cause illness, with diarrhoeal disease being the most common among children under 5.

Hand-washing practices were measured by asking mothers to demonstrate how and when they wash their hands and then assigning a score of 0-10, with scores over 7 indicating appropriate hand-washing practices. Using this indicator, the mean score was 8.02 and 62.84% of mothers demonstrated appropriate hand-washing practices (table 21). Furthermore, 84.07% had soap or ashes available in the house.

HYGIENE INDICATORS	SAMPLE	MEAN OR PROPORTION	LOWER CI 95%	UPPER CI 95%
MOTHER WITH APPROPRIATE HAND-WASHING PRACTICES (SCORE >7)	705	62.84	53.99	71.68
PRESENCE OF SOAP IN THE HOUSEHOLD	705	84.07	79.42	88.71

Tab. 21. Hygiene indicators.

The discussions in the communities highlighted that for corporal hygiene priority was given to babies : mothers assume that babies are often dirty and need to be washed every day, if possible with soap, while children able to walk can stay several days without taking a bath. Good hygienic practices were defined as:

"Clean body , clean clothes, cut nails, drink safe water but due to workload women have no time to do it often; they only manage to purify the drinking water" (mothers, Dambi Hora) .

"Wash body, clothes, clean surroundings of house, clean the drinking water container" (mothers, Silala).

While hygiene practices are difficult to assess through focus group discussions, participants feel that not all people in their village implement hygienic practices and this is thought to be due to parent's negligence and lack of water. In addition, a common challenge for most households is the lack income to purchase soap on a

[66] Federal Democratic Republic of Ethiopia, Health and Health Related Indicators, 2011.

regular basis. Nevertheless, during an FGD during the qualitative study, we met a family who, while saying that they did not have soap to wash babies and children, tused soap to wash the wound of a calf, which was attacked by a hyena.

5.2.2 Hypothesis O. "Inadequate access to safe drinking water due to surface water being the main source of water and long distance (and time) to collect water."

Domestic water supply covers both access, quantity and quality. Poor water supply can negatively impact child nutritional status due to exposure to pathogens, which may cause illness, with diarrhoeal disease being the most common among children under 5. Although households may have access to a safe water source (point of delivery), the water actually drunk (point of use) may be contaminated due to a combination of contamination during transportation (point of delivery to HH) and/or due to poor water storage and treatment at household level. The amount of water available will also affect hygiene practices. Domestic water supply, water storage and transportation practices were explored in relation to this causal hypothesis.

According to RFS, the main source of water either during rainy season (33.05%) and dry season (48.94%) is groundwater, followed by surface water (32.48 %) in rainy season and piped supply (36.88 %) in dry (figure 15). This does not inform about the quality of water: indeed if the system extracting groundwater or the piped network are not protected and allow contamination to come in, then the water may not be of better quality than surface water.

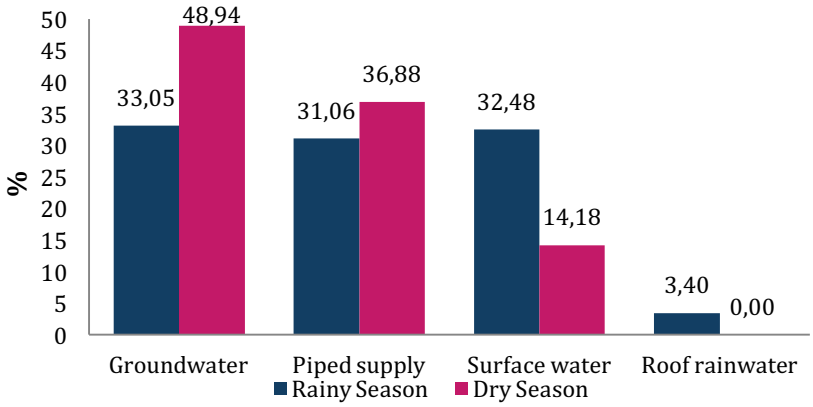


Fig. 15. Source of water during rainy and dry season.

During discussions it appeared that one community had a hand-pump close to the village but its water was salty and not good even for animals, and inhabitants were obliged to go fetch water at a dam.

"Before we were drinking water from the dam and we never had disease. We have hand-pump since 6 years but it is broken since 3 months, so we drink back from the dam and now we are getting sick, why?" (Village leader, Midhaga)

The time needed to collect water varies between the rainy and dry seasons since the source of water varies: during the rainy season communities go to the closest water sources (dams and ponds) to fetch water even if their quality is not good. During the dry season, when water points get dry, 49.93% of respondents take more than 30 minute to fetch water (table 21), while only 32.63% of them take more than 30 minutes during the rainy season.

INDICATORS	SAMPLE	MEAN OR PROPORTION	LOWER CI 95%	UPPER CI 95%
Distance to water source rainy season	705			
< 30 minutes		67.38	56.23	78.53
31 to 60 minutes		22.98	14.56	31.40
2 to 3 hours		7.66	2.16	13.16
> 3 hours		1.84	-0.73	4.42
Don't know		0.14	-0.14	0.43
Distance to water source dry season	705			
< 30 minutes		50.07	38.65	61.50
31 to 60 minutes		26.10	17.89	34.31
2 to 3 hours		14.47	5.26	23.68
> 3 hours		9.36	2.24	16.48

Tab. 22. Distance to water source.

The quantity of water per household was not estimated through the quantitative survey but it was assessed during the FGD. In general, during rainy season households collect 2 jerricans of 20 L /day (either 2 jerricans in one trip, 1 trip every two days, if the household has donkey; or 2 trips of 1 jerrican each.) , meaning 40L/day/household. The quantity of water per person is then 6.63 L/day which is much below Sphere standards of 15 L/day/person. During dry season, since the distance to collect water is higher and often one trip per day is the maximum, households collect only 1 jerrican of 20L. When the mother plans to wash the family's clothes she will borrow a donkey from a neighbor or she will do 2 trips to collect water, in addition to the trip needed to fetch drinking water.

The mean household water management score was 2.62 indicating a moderate risk of water contamination. Figure 16 shows that only 2% of households were not at risk of water contamination between collection, transportation and use at the household. Water was often collected and transported in old jerricans often without lids. The

drinking water was store inside the house in a 20 liters jerrican with lids and the cooking and washing water were stored outside the house, often without proper lids. The qualitative enquiry revealed that the water containers were washed once a week inside and outside with soap or ashes.

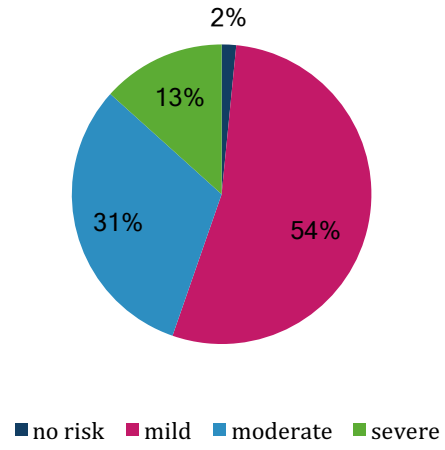


Fig. 16. Water management score from point of delivery to point of use.

In one community visited the drinking water was filtered with a filter distributed by the Red Cross, but the filtered water remained in a bucket uncovered.

91.49% of households reported to do something to their water to make it safer to drink and majority of them (76.02%) implement good practices (figure 17). The good practices include boiling, adding bleach or chlorine, using water filter and solar disinfection, whereas filtering through a cloth and settling the water are not considered to be protective.

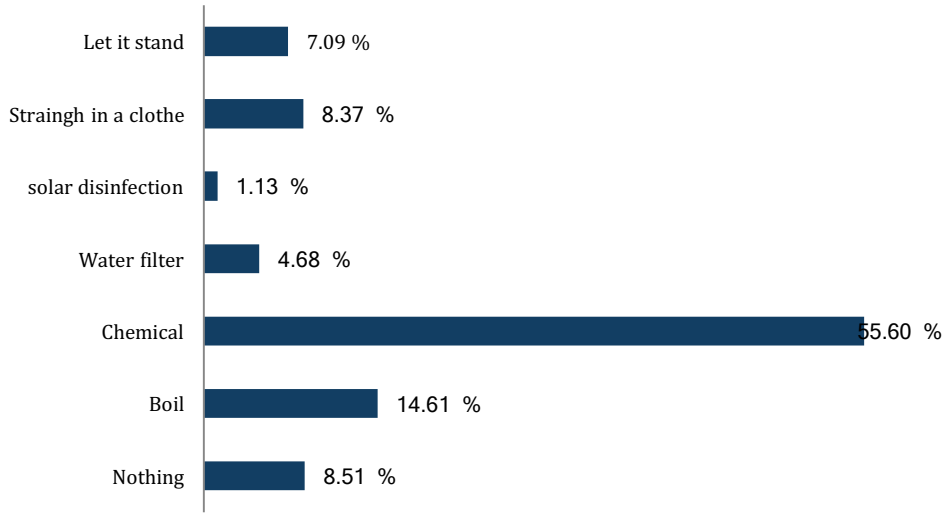


Fig. 17. Drinking water treatment.

Nevertheless as chemicals (tablets containing chlorine) are mainly supplied by government or NGOs, there are sometimes shortages in the supply and chemicals are not available. In the villages where there is a small shop, chemical may be found, but all the households will not buy them, some preferring to receive it free of charge.

Moreover, since women have high workload, they may not always have time to implement good practices of water treatment, specially boiling of water. These figures have therefore to be taken with caution.

In the majority of groups, communities were aware that drinking unclean water was not good for health and drinking unclean water was perceived as a main cause of disease, diarrhoea in particular.

Figure 18 shows how the inadequate access of safe drinking water leads to an increased risk of child undernutrition.

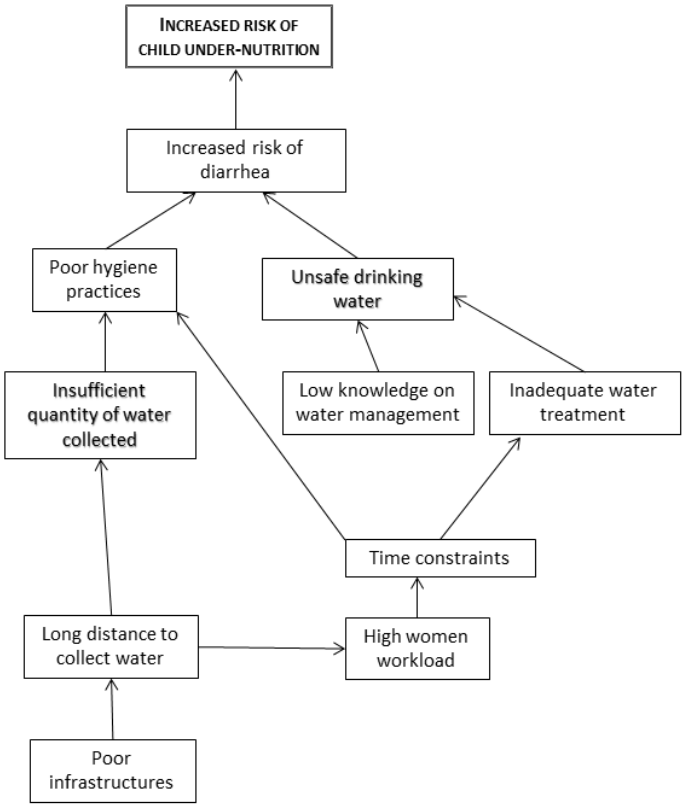


Fig. 18. Causal pathway of inadequate access to safe drinking water to undernutrition.

5.2.3 Hypothesis P. "Exposure to unclean environment."

The height of a child reflects their genetic predisposition as well as his/her childhood health and nutrition environment; in developing countries the latter becomes more important. One study found that households without latrines were significantly more likely to have children under 6-years who were wasted[67]. Young children suffering from insalubrious sanitation conditions and poor care practices face particularly high risks, leading them to absorb pathogens present in the soil (notably *E. coli* present in poultry faeces ingested by young children); this leads to the development of environmental enteropathy which reduces the ability of the intestinal lining to absorb nutrients by

[67] A Sharghi, et al., Evaluating risk factors for protein-energy malnutrition in children under the age of six years: a case-control study from Iran, Int J Gen Med, 2011

causing damage to intestinal microvillus, triggering an immune reaction and ultimately resulting in chronic malnutrition.

In the RFS, 78.30% of households were using a sanitation facility (table 23). Of these 8.09% were considered as being safe and hygienic. Compared to national statistics of 44.8% in rural area[68], open defecation was much less at 21.7% in the NCA context. Indeed, several NGOs are promoting latrine construction and some of them are supplying slabs. Two of the visited communities constructed latrines 2 to 3 months before the beginning of the NCA: one through the promotion of a local NGO, another through the promotion of the HEW.

INDICATORS	SAMPLE	MEAN OR PROPORTION	LOWER CI 95%	UPPER CI 95%
Latrine	705			
Use of latrine		78.30	69.41	87.19
Use of safe latrines		8.09	3.89	12.28
Safe disposal of child's feces	338	51.18	2.72	45.83

Tab. 23. Sanitation indicators.

According to the qualitative enquiry, even if the latrines are available, household are reluctant to use them, in particular men. Men use to urinate in the "MONA" and defecate in the bush.

"Beliefs are problem in this village : they have latrine but one ancestor told that the day when Borana will start urinating and defecating in the same place it will be the end of Borana culture. Then they don't want to use latrine" (HEW, Dambi hora).

Most of the latrines visited during the qualitative enquiry were local latrine (pit latrine without slabs): they were dirty (presence of excreta and urine on the ground and around the pit) and no water nor soap or ashes were present. In one "GARE" (grouping of 5 to 10 households) of one community, the latrines were closed with padlocks and they were containing water and soap inside. The owners of these latrine revealed that they were obliged to do so if they wanted to keep their latrine safe and hygienic. *"Now we know that it is important to use latrine and it is important to keep them clean. We have to lock the door if we don't want other to use them and to dirty them. Some people are not educated and don't know how to use them" (father, Dambi Hora).*

Women are in charge of the cleaning of the toilet and most of them said that they clean latrines by brushing the ground, once a week.

Animals (cows, goat, sheep, chickens, donkeys) were freely roaming, and most of the mothers reported regularly finding animal faeces inside the house or the kitchen. The surroundings of the houses are mostly swept once a day (usually in the morning), and

[68] EDHS, 2011.

the excreta are put under a tree or in the cow or goat/sheep enclosures, which are close to the house. These enclosures are cleaned every day (usually in the evening) and the dungs are piled up out of the "border of the housing"69. Additionally, communal spaces contained a lot of waste, mainly plastic (empty bottles, biscuit packaging, and empty medicine boxes). Children, who were often half naked (without underwear and pants) despite the cold weather during the NCA, commonly played on the ground. In most of the communities this was one of the main perceptions of poor care, and a cause of poor health and hygiene due to *"children eating dirty soil".*

Open defecation and unhygienic environments increased exposure to germs and hence increased risks of diseases impacting on child nutrition. Use of unsafe water, presence of faeces in the yard and lack of sanitation facilities have been shown to be associated with increased diarrhoeal incidence.[70] [71]

6/ FOOD SECURITY AND LIVELIHOODS

6.1 DESCRIPTION OF FSL CONTEXT

In Ethiopia pastoralists are among the most vulnerable people[72]. The Borana production system is a pastoral/agro-pastoral system which has adapted to the variation of the changing seasons, climate variability and spatiotemporal heterogeneity of forage production[73]. Livestock production is the main livelihood for people, with increasing involvement in crop production and other livelihood strategies. Pastoralist livelihood is increasingly under threat because of a combination of factors including environmental degradation, invasive species reducing pasture, climate change (changing rainfall patterns, increasingly frequent and severe droughts), changes in land management and poor management of resources. Livestock disease is another major challenge. Increasing population (estimated growth rate is around 2.5%/year) and livestock levels put further pressure on the limited resources in the environment. Government policies (e.g. relating to land use and settlement) and issues relating to land tenure (wealthier claiming exclusive access to rangeland, or the establishment of private farms) and access (fencing of pasture lands) impose a range of further challenges and limitations on pastoralists. Although seasonal herd mobility is

[69] Around the "gare" there is a small fence made with shrubs which delimits the houses from the latrines and the dung piles
[70] Van der Slice, Drinking-water quality, sanitation, and breast-feeding: their interactive effects on infant health, Bull World Health Organ. 1994.
[71] I Günther et al., Water, sanitation and children's health: evidence from 172 DHS surveys, World Bank Policy Research Working Paper Series, 2010
[72] Desta S. et al. (2008) Pastoral drop out study in selected woredas of Borana zone Oromia regional state. CARE International in Ethiopia.
[73] Megersa & al., The role of livestock diversification in ensuring household food security under a changing climate in Borana, Ethiopia, International Society for Plant Pathology, November 2013

practiced, but on a considerably reduced scale, households have increasingly settled in villages.

6.2 HYPOTHESES FROM THE INITIAL WORKSHOP

6.2.1 Hypothesis Q. "Low income due to livestock depletion" and R. "Low income generating opportunities"

"Cattle have important socio-cultural roles and are regarded as part of pastoral identity. An individual without cattle does not fulfil the social standards of the society. Furthermore, the Borana have strong customary laws and social organizations that account for their effective management of livestock and rangeland resources. (….) However, the Borana are gradually shifting from surplus towards subsistence production. Convergence of environmental factors and external drivers such as inappropriate development interventions and population pressure has eroded their per capita cattle[74]."

Wealth is determined by livestock holding and access to land. Large herd size contributes to food security through food supply (dairy products, meat), source of income (sale of livestock and livestock products), as a hedge against risks and as a means of capital accumulation that can be exchanged for food in times of deficit. Due to recurrent drought, there is a decrease in pasture and water availability impacting the body condition of animals, sometimes leading to their death. Since the 1980s, Borana have experienced several droughts causing huge losses of livestock, cattle in particular: "Average cattle holdings dropped from 92 to 58 head/household between 1980 and 1997, respectively. Over 17 years our target population of 7,000 households lost 700,000 cattle with a capital asset loss valued at USD 45 million[75]". (table 24):

YEAR	LOCATION	LOSSES
1983-84	Borana plateau	90% calves, 45% cow, 22% mature males
1983-85	Borana zone	37% cattle
1991-	Borana	42% cattle

[74] Megersa & al., The role of livestock diversification in ensuring household food security under a changing climate in Borana, Ethiopia, International Society for Plant Pathology, November 2013
[75] Morton J., 2006. Policy options paper : community based drought management for thepastoral livestock sector in sub-saharian Africa., an ALive Policy Note

YEAR	LOCATION	LOSSES
93	zone	
1995-97	Southern ethiopia	78% cattle, 83% sheeps and goats
1998-99	Borana zone	62% cattle

Tab. 24. Livestock losses from 1980s to 2000[76].

In late 2011, the greatest drought of the period decimated over 250,000 cattle in the Borana zone (most affected zone of the country): in Miyo woreda 60% of cattle and 2 % of goats/sheep were lost and in Moyale woreda 30% cattle and 2 % goats/sheep[77].

These recurrent droughts *"have compelled the Borana herders to pursue alternative livelihood strategies such as livestock diversification, crop cultivation and non-pastoral activities. Consequently, there is a progressive shift from centuries old socio-cultural cattle pastoralism to multispecies herding with an increasing tendency to keep more drought tolerant animal species"*.

According to the RFS, among 82.98% of households having livestock, the average number of each species' heads is between 1.7 (bovine) and 3.2 (ovine) (figure 19)

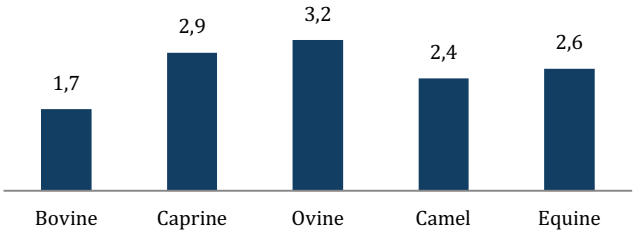


Fig. 19. Average number of livestock owned per household

Households have mainly female animals (up to 31 dry cows and 10 lactating ones, up to 50 lactating goats and 30 lactating ewe) and young (14 calves, 10 lambs, 10 goats, 7 camels) (figure 20).

[76] Adapted from Morton J., 2006. Policy options paper : community based drought management for thepastoral livestock sector in sub-saharian Africa., an ALive Policy Note.
[77] ERCS and IFRC, Oromia drought assessment, 12-16 august 2011.

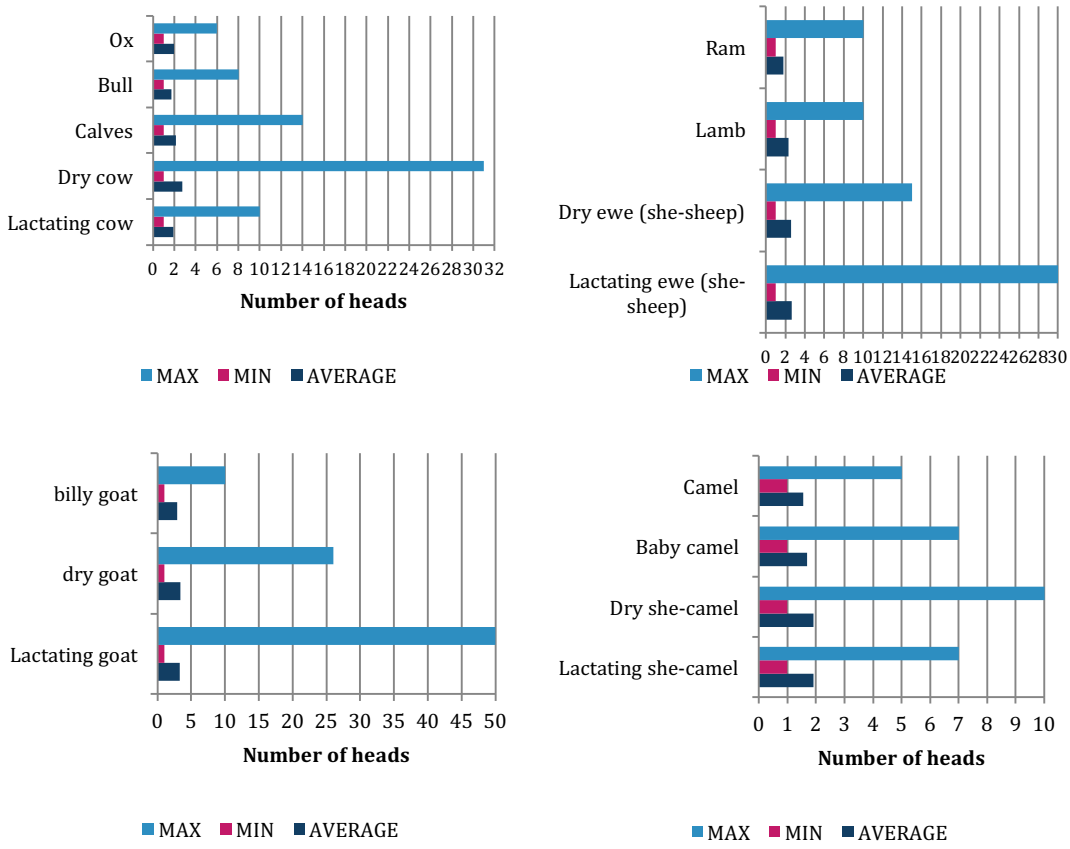


Fig. 20. **Herd composition by specie.**

Livestock diversification is observed: even if cattle are preferred in Borana culture, camels, more resistant to drought, are present as well but less represented (only 11.49% households have camels,figure 21).

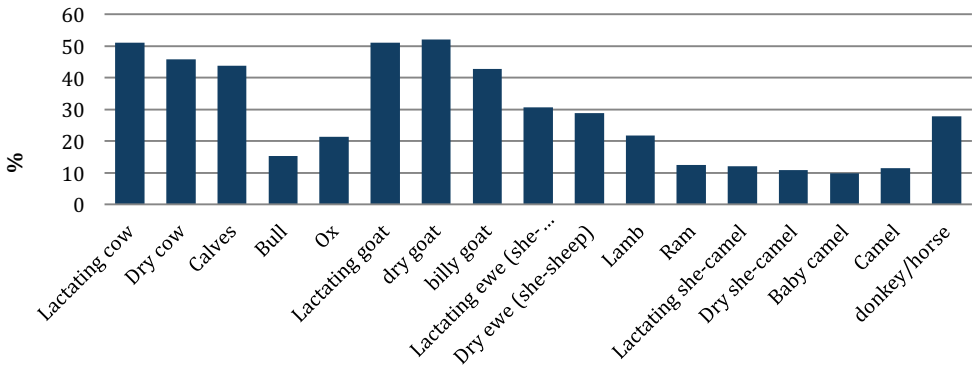


Fig. 21. **Proportion of HH owning animals.**

Livestock herds' recovery to pre-drought levels takes many years since restocking after a drought is difficult because there are few female animals on the market and the remaining animals are weak and vulnerable to a range of animal diseases. Therefore the primary source of income of pastoralist is low.

To cope with effect of recurrent droughts, pastoralist have diversified their livelihood: 56.60% of them are engaged in farming (maize and haricot beans – 99.7% of households- mainly for consumption; teff -11.3% - and wheat -20.1%- mainly for sale, figure 22)

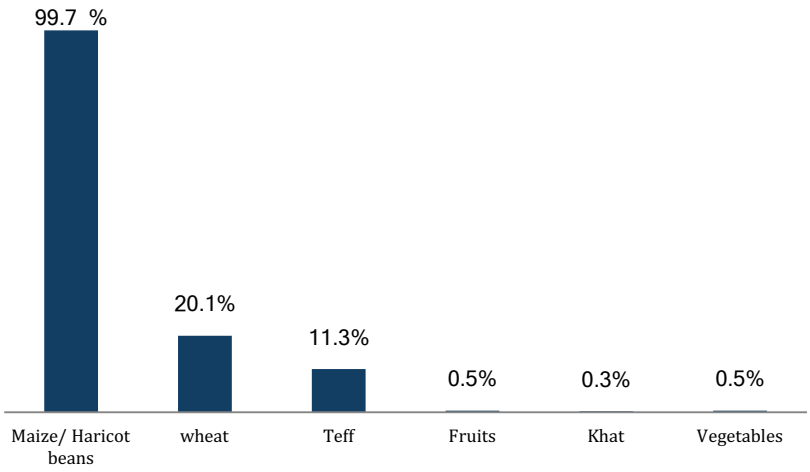


Fig. 22. Crops cultivated .

"During long rainy season harvest is better than during short one. Normally we are able to produce enough to feed the family throughout the year and will not buy grains in the market" (fathers, Silala).

"The situation is worse than last year at the same period because last year the harvest was very good and the grain stock in april was higher than this year" (fathers, Silala)

"Some families are selling their animals because they are fed-up of livestock rearing and they have shops in Moyale town and farm in the village" (father, Dambi Hora).

Since the rains are erratic and very localised, the majority of households reported that crop production was often bad and they had to diversify more their livelihood: they get themselves involved in firewood sale, charcoal making and sale, petty trading. This has an impact on women's workload since they are the ones collecting firewood for sale and making charcoal, and an impact on the environment as well. In the communities close to Moyale town, some men go to employ themselves as casual labour, and others open small shops in town. Some women reported they were involved in smuggling with Kenya: they carry items from Kenya to Ethiopia on their back using small and hidden trails.

The opportunities to generate income are low in the study area, particularly in the communities far from main towns.

Evidence on the association of undernutrition with household socio-economic status and wealth is strong. A meta-analysis showed that household income had the largest impact on child nutrition out of a number of biological, demographic and sociological factors.[78] Limited livelihoods and poor incomes could be having an effect on the outcomes of the whole community with Yang (2009) finding that village income had a greater positive effect than household income on exclusive breastfeeding, drinking boiled water, hand-washing with soap, and reducing stunting.[79]

[78] Charmarbagwala R. et al. 2014., The determinants of child health and nutrition: A Meta-analysis
[79] Yang C. and al., 2009. Effect of village income and household income on sanitation facilities, hygiene behaviours and child undernutrition during rapid economic growth in a rural cross-border area, Yunnan, China., J Epidemiol Community Health,

6.2.2 Hypothesis S. "Inadequate access to milk and animal products by children and mothers"

"Animal milk has long been recognized as an important component of pastoralist diets across the world. At the same time, milk is a nutrient dense food and is thought to contribute a high proportion of the nutrients required by the many pastoralist groups that rely on it[80]"

As mentioned previously, cow milk has an important place in children diet (cf.4.2.9 and 4.2.10), and it is also a source of income.

"When we need money, if the milking gives 5 cups, we will keep 3 for the children and we will sale 2. There is a woman in this village who buy the milk to several families and she goes to sale it in Moyale town" (mother, Dambi Hora)".

Droughts have depleted livestock herds in the past decades, and the number of lactating cows has decrease Erratic rainfall implies a decrease in pasture and water availability for animals, leading to a deterioration of livestock body condition and/or livestock death. Milk' production is therefore decreased, either in quantity or quality, decreasing pastoral households' food intake.

"In our village, some families have to buy milk for their children because they have little number of animals" (mother, Midhaga)

"In the olden days, there was plenty of cows and plenty of milk. When women were going to fetch water or to collect firewood, they were taking a pot of milk with them and they were drinking milk throughout the route. They were strong. Nowadays, we have only few animals, women can only drink water when going to collect firewood, they are weak." (Traditional Birth Attendant, Dambi Hora).

Nowadays, milk is given in priority to children, especially during dry season when the quantity of milk decreases (Annex 7 seasonal calendar). It seems that herders prioritize animals able to produce milk throughout the dry season as goats and camels. But milk is also used to feed young animals and there is sometimes a competition between children and animals, even if lack of milk is perceived as a pre-cursor of undernutrition. Communities perceived child growth and adult' body condition to be decreasing as a result of declining milk production.

"Animals are our properties, without them we are nothing. We have to make sure that calves get enough milk during dry season, so for our children we add water to the milk" (father, Silala).

As shown in a study done in Borana in 2013[81], "the traditional use of milk by the local people as the family's staple food has been eroded, giving rise to a monotonous cereal-based diet and compromising their nutritional wellbeing. Respondents consider that this alteration of diet has brought about poor growth in children and stunting, and poor body condition in adults (…). It is not surprising that the change in pastoralists' staple from milk to cereals adversely affects their nutritional status, particularly children and women, who are the most vulnerable members of the society".

[80] Sadler K. and Catley A., 2009. Milk matters : The Role and Value of Milk in the Diets of Somali Pastoralist Children in Liben and Shinile, Ethiopia. Addis Ababa, Feinstein International Center, Tufts University and Save the Children
[81] Megersa & al, 2013. The role of livestock diversification in ensuring household food security under a changing climate in Borana, Ethiopia,., International Society for Plant Pathology.

6.2.2.1 Hypothesis T. "High food access instability"

Since the agricultural production is minor, most staple food has to be purchased. The food access in the communities varies throughout the year: food shortages coincides with depletion of household resources and unfavourable terms of trade between livestock and staple cereals, during dry season when livestock body condition is weak and price of cereals high. In times of drought and food shortage, increased off-take is obligatory to meet the household's demand for food grain and to minimize animal losses caused by drought.

Figure 23 shows that the months where the most households experienced food shortages in the previous 12 months were February and March, after the short cropping season, when the production of milk is low.

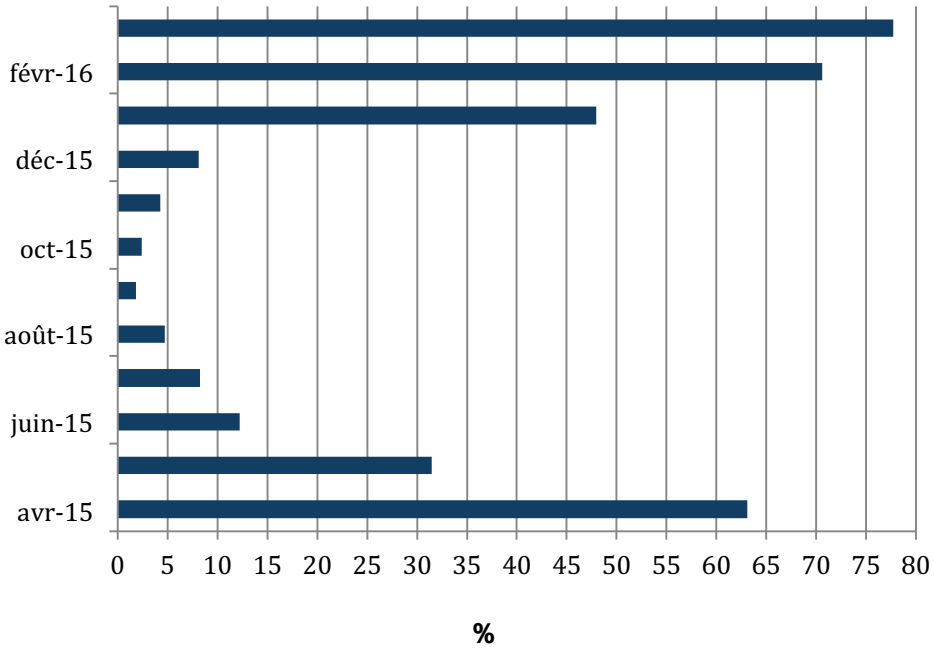


Fig. 23. Proportion of households with inadequate food provision, by month.

Majority of the food is bought in the market, except for cereals which almost 35 % comes from the relief aid/PSNP. Figure 24).

"If you have money you have access to food" (father Silala)

While livestock is the base of the livelihood in the survey area, majority of the milk or milk product consumed in the households are bought (56.2%). This emphasize the decrease of own production due to livestock depletion (due to previous droughts or off-take to buy food) highlighted during qualitative enquiry.

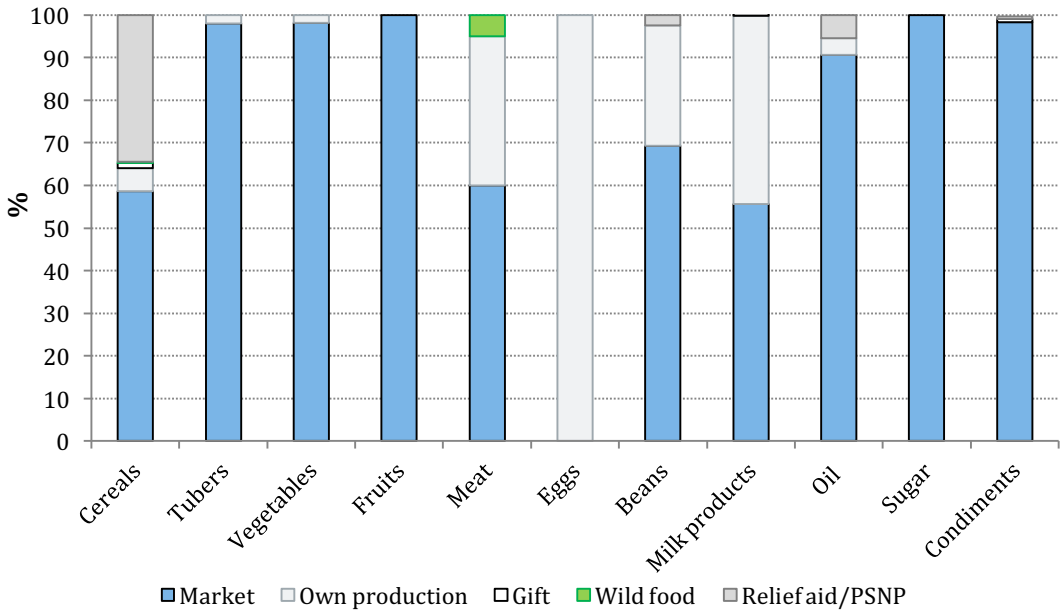


Fig. 24. Source of food.

The RFS measured the household dietary diversity score (HDDS) of sampled households to assess food access (table 25). The results found that the mean HDDS score was 3.71.

Group 1 HDDS<3	Group 2 HDDS 3-4	Group 3 HDDS 5-6	Group 4 HDDS>6
223 HH (31.63%)	201 HH (28.51%)	255 HH (36.17%)	24 HH (3.4%)
Cereals	Cereals	Cereals	Cereals
Milk and milk products	Milk and milk products	Milk and milk products	Milk and milk products
	Oil and fat	Oil and fat	Oil and fat
	Sugar/honey	Sugar/honey	Sugar/honey
		condiment	condiment
			Legumes and pulses
			Tubers & roots

Tab. 25. Food groups consummed by households.

Evidence for the association between food security and child undernutrition is lacking in the scientific literature, in part due to the difficulty to assess food security. However, a study in Bangladesh found that underweight and stunting was significantly lower in

food-secure households[82], and a study in Ethiopia shown that household food insecurity was associated only with underweight[83]

6.2.3 Hypothesis U. "Lack of food diversification / poor diet diversity"

As observed in the table 25 above, only 3.4% of the interviewed consume more than 6 food groups and have a diversified food. Others depend mainly on cereals and dairy products. The staple meal in the studied area is "KORAN-KORA", made with maize and haricot beans, and milk. Even though it was common for households to own chickens, the eggs were usually sold in the market. Indeed, traditionally Borana don't eat eggs as they come from "birds and birds are dirty". Nevertheless, with the awareness done by HEWs, in some communities mothers start giving eggs to their child and some of them take when pregnant (but they stop eating after the delivery).

In general, throughout the year, household dietary diversity is very low with mothers typically preparing tea with milk for breakfast, and "KORAN-KORA" for lunch and dinner. Meat is only consumed on special occasions such as "GUBBISSA[84]" and "MOGGATI[85]", "NYAACHISA[86]", "KORBASA[87]", "QABANQABA[88]", or during pregnancy of women if they are willing to eat meat.

"If a pregnant woman wants to eat something and it is not available at home and she cannot eat it, she may lose her baby. The cravings of the pregnant woman has to be satisfied" (grand-mother, Bede).

Each family slaughtering an animal has to give a piece of meat to the pregnant women of the village.

The poor diet diversity seems more linked to the lack of knowledge about importance of diet diversification than the access to diversified food.

While fish, fruits, vitamin A rich vegetables and tubers are not part of their diet and access to such food groups largely depends on a cash economy and availability in local markets, there is a potentially high risk of certain micronutrient deficiencies in the study area.

6.2.4 Hypothesis V. "Intra-household food allocation not favouring the women"

The RFS showed that in 85.11% of households the children eat first, followed by fathers, and mothers eat last (78.5%) the left-over of the meal (Annexe 6). Qualitative enquiry reflected that up to 5 years old, children eat first and same quantity of food is given to boys and girls. When a girl is over 5 years old, she will be given less food than

[82] KK Saha, Household Food Security was Associated with Growth of Infants and Young Children in Rural Bangladesh, FASEB J, 2008
[83] Ethiopian Public Health Institute, 2012. Household food insecurity and its association with under five children nutritional status in Sekela District, Western Ethiopia.
[84] Ceremony for the naming of the 1st son when you have to slaughter a cow or a sheep (other animals not allowed)
[85] Ceremony for the naming of the others children (either male or female). If it is a boy, you slaughter a goat but if it is a girl you canno slaughter any aninal
[86] Boys belonging to the same agement go together from house to house, they slaughter animal and eat the meat.
[87] Young men (> 25 years) born the same year join all together, they go to slaughter an animal under a specific tree. Women not allowed to be near this tree during the ceremony.
[88] Ceremony of circumcision for boys and girls.

her brothers: indeed, *"boys from 5 years old can start looking after animals and they need more food since they maybe cannot be back at home for lunch".* It seems that in Borana culture it is shameful for a woman to eat a lot, and girls have to get used to eat small quantities from their childhood. *"If a girl eats a lot when young, once she will be married she will eat a lot as well and she will not leave food for her children" (Grand-mother).*

"Boys don't care if the mother has food or not, they will not share with her. But girls will always give some of their food to their mother" (mother, Midhaga).

"women are given healthy food during the "ulma" but after they eat family food and the quantity of food is small since women eat the leftover of the family meal and it can be small amount" (mother, Silala).

When doing the rating exercice in the communities, some men were surprised to see their wife considering the intra-household food allocation as a big issue, they didn't realize the potential impact of low women'food intake on their health and on the child's one.

"Now I understand that if my wife eats a lot, she will be healthy and she will give birth to healthy children. From today I will share my food with her" (father, Midhaga).

In another village the fathers were well aware of the importance of women 'food intake but were feeling helpless when faced with the traditional believes.

« We know that our wives should eat more, we try to convince them to eat more but they refuse. What can we do?" (father, Dambi Hora).

6.2.5 Hypothesis V. "Change in access to pasture"

Rangeland is the most important natural resource in pastoral areas. "Pastoralists manage their livestock herds by managing their rangelands and their mobility across those rangelands[89]"

Borana pastoralists have different types of grazing lands with various forms of customary management, control and access:

- The traditional "*KALLOS*" are communal enclosures who were initially not fenced and which purpose was to conserve pasture or put aside a section of rangeland for milking cows, calves and sick animals during the dry season/times of drought. During rainy season no animal is allowed to enter into the KALLO. Since 1980's, "*KALLOS*" are mostly fenced
- The "MATA TIKA": the grazing land of the dry season. It doesn't refer to a geographical space but the distance animals can walk. Goats and sheep come back to the village at night ("WORRA MATA TIKA") while cattle can stay overnight ("FORRA MATA TIKA").

There are more and more government-initiated and NGO-initiated enclosures, which are not managed according to customary laws:

- "*MITIREE*": enclosure set aside by government or NGOs and managed by the head of kebele for bush clearing. These enclosures are open during dry season and in theory all the animals of the community are entitle to graze there. But if there are too many animals compare to the potential of the "*MITIREE*", the head of kebele can decide to allow only weak animals or to allow only one part of the herd.

[89] Pavanello & Levine, 2011. Rules of the range : Natural resource management in Kenya-Ethiopia border areas.

- "*DAGAA*": land which remain bear due to erosion. Government, through PSNP, and NGOs ask to reclaim these land through tree plantation, drainage digging. Animals are not allowed to graze in these lands but during dry season any person from the kebele is allowed to cut grasses provided they pay (10ETB /bag of 15Kg).

Moreover, private enclosures are increasing either for agricultural purposes (promoted by government policies as livelihood diversification) or commercial livestock fattening purpose (promoted by government as well). The "*WALIDAA*" is an enclosure belonging to a group of persons who decided to buy animals in common to fatten them for commercial purpose. The rest of the community is not allowed to graze in this land. These enclosures are often taking the most productive and fertile land from the common range. Indeed, crop production requires wet areas that are suitable as dry season grazing areas. Thus expansion of cropping is causing shrinkage of dry season grazing area.

Private range enclosures limit pastoralists' mobility and access to land and undermine traditional community support and management mechanisms. This implies an unequal access to grazing lands since poor pastoralists have limited access to private enclosure and "wealthier pastoralists benefit more because they have more animals that can use the *kallo*"[90]. Being unable to maintain their traditional way of life, many pastoralists, and particularly youth, 'drop out' from pastoralist communities and move to urban areas[91].

"Increasingly in the dryland and pastoral areas of Ethiopia a privatisation of resources is being seen due to issues such as the influence of commercial interests (removal of land for developments such as sugar/cotton plantations and other agricultural use) together with a marked growth of enclosures and 'private' grazing or water sources. The 'selling-off' of rangeland resources has increased for private gain[92]"

Conflict over diminishing grazing land and water between clans is common in the area. There were several clashes between Borana and Gabra and between Borana and Garri who led to displacement of population in the pas and reshaped the access to grazing areas, especially in Moyale woreda.

"Now we have go to Kenya with our animal because Garri impede us to go to our traditional grazing lands." (father, Dambi Hora)

"The left hand-side of the road to Moyale belong to Borana tribe, it is our traditional grazing area but because of the conflict with Garri we cannot go there anymore. If you try to go ther with your animlas, they will be kept by Garri and you may die". (father, Dambi Hora)

6.3 RELATION WITH OTHER SECTORS

Hypotheses Q and R have an impact on WASH and MHCP sectors :

- Income and the income generation opportunities being low, household prioritize the purchase of food, and they may be not able to purchase soap.

[90] Napier and Desta, 2011. Review of pastoral rangeland enclosures in Ethiopia.
[91] CARE, 2008. Pastoral drop out in selected woredas of Borana zone, Oromia regional state.
[92] Flintan F., "A sharing of past experiences" in Gender & pastoralism Vol.1 : Rangeland and resource management in Ethiopia, 2007.

Lack of soap within the household has negative impact on hygiene practices and increases the risk of diseases.

- Diversification of income source (firewood collection and sale, charcoal making and sale) increases women's workload, impacting their ability to properly take care of their children.

7/ HYPOTHESES AND CAUSES EMERGING FROM THE DATA COLLECTION

During the qualitative inquiry a new hypothesis emerged: **Hypothesis X: "beliefs and tradition"**. Indeed it appeared that Borana beliefs and tradition an impact on:

- Mental health : the role and responsibilities of women in Borana society implicating a high workload, a low decision power, a low maternal well-being, low educational opportunities
- IYCF : the practices of prelacteal feeding (water and "kumbi" given to boys at birth, cow milk given to boys and girls up to the fall of umbilical cord), the low exclusive breastfeeding practice (cow milk believed to give strength to babies and being given in addition to breast milk), the inappropriate complementary feeding practices (the believe of child not able to eat anything than cow milk and breast milk until he has his front teeth), the preference for boys shortening the breastfeeding period of girls.
- Family size : the preference for boys and the willingness to have as children as possible implying high number of children and less appropriate child caring or feeding
- Hygiene and sanitation: the soap available in the household being sometimes utilized for animals instead of children, and the low utilization of latrines by fear of Borana's extinction if people urinate and defecate always in the same place
- Food security : the intra-household food allocation disfavoring women, impacting their daily food intake and increasing the risk of poor nutritional status, and food taboos (eggs not eaten) limiting the food diversification

Figure 25 presents the causal pathway from beliefs and tradition to increased risk of child undernutrition

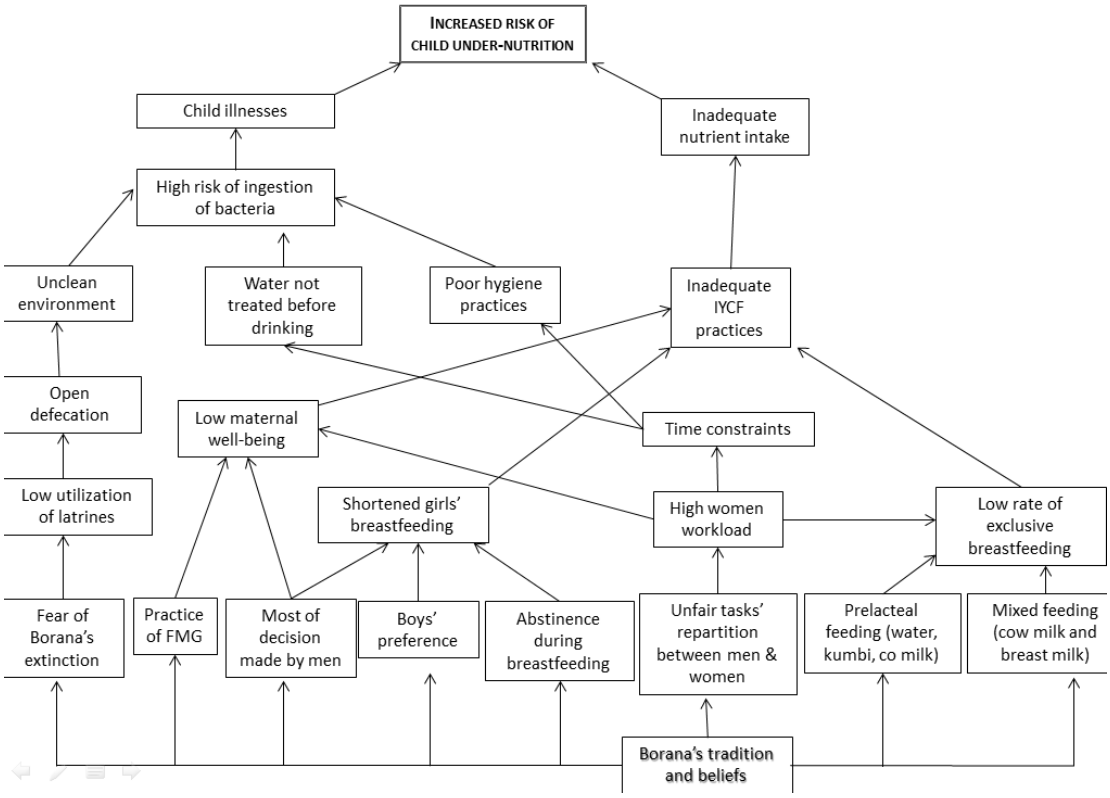


Fig. 25. Causal pathway of beliefs and tradition to undernutrition.

8/ SEASONALITY, HISTORICAL TRENDS AND SHOCKS

8.1 SEASONALITY AND MEDIUM TERM TRENDS OF UNDERNUTRITION AND RISK FACTORS

Seasonal calendars were developed with focus group participants of each village to demonstrate the seasonality of some risk factors over the season and the years (Annex 7).

Malnutrition and hunger gap:

Figure 26 and 27 present the cases of acute malnutrition identified and treated by the woreda health offices between January 2013 and April 2016.

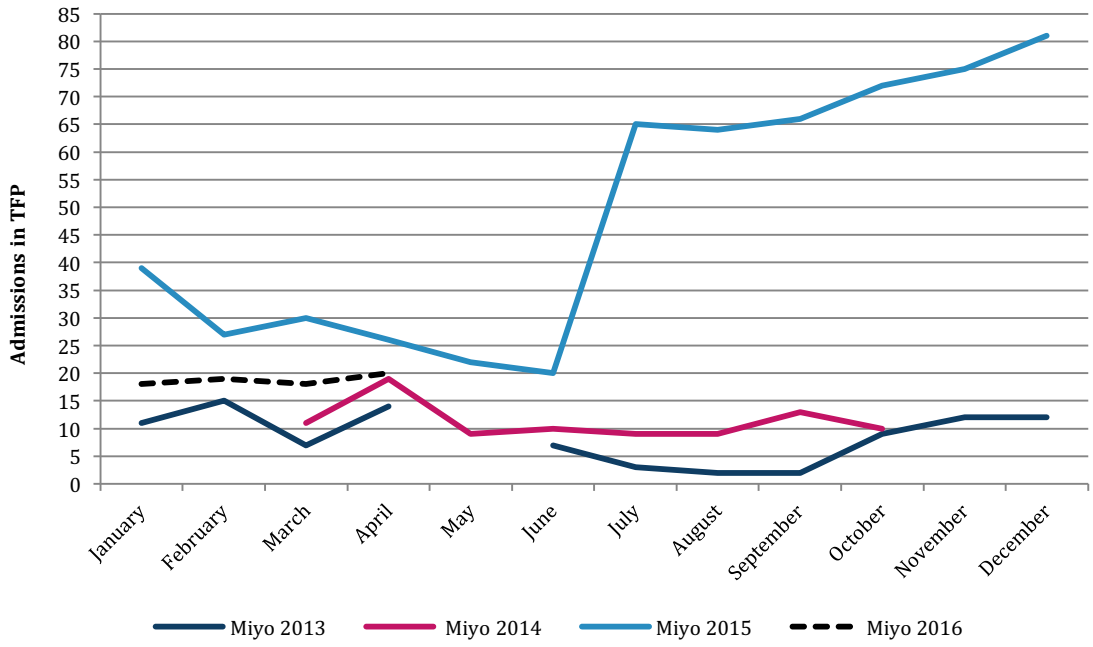


Fig. 26. TFP admissions trends, Miyo woreda, 2013-2016.

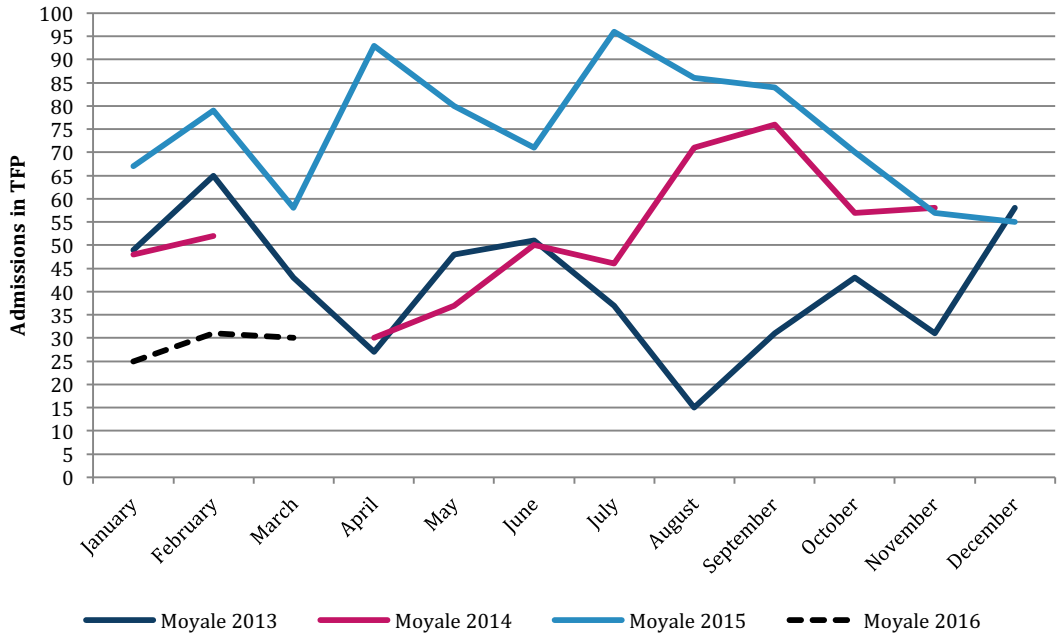


Fig. 27. TFP admissions trends Moyale woreda, 2013-2016.

Curves are serrated and we do not observe a real peak of undernutrition. These figures are challenging to interpret since many factors contribute to the peaks as completeness of reports (quality and timeliness) and screening coverage.

Acute malnutrition is perceived to be highest between January and April for the two communities of Moyale woreda, and between November and April for the two communities of Miyo woreda.

According to communities, the hunger gap months are between February and May, the worst month being March when the main rains didn't start yet, the animal 'body conditions are bad, the milk production is very low and the food stocks are exhausted.

Incomes:

Income is highest from November to March when livestock is sold. In the communities able to sale a part of their crop production (teff or wheat) they have income during harvest period, in June-July and November-December. The communities involved in firewood collection and sale get small income throughout the year.

Food prices:

Food prices are perceived high in February and March, months when the animal 'body conditions are worst and the term of trade is unfavourable for herders.

Weather:

There are four seasons: one cold dry season from June to august ("ADOLESSA"), one short rainy season in September –October ("HAGAYYA"), one warm dry season from November to March ("BONA HAGAYYA") and a long rainy season from mid-March to May ("GANNA").

Child illnesses:

The major illnesses affecting are malaria ("QANDHO" or "DIDIGA") during the rainy season due to stagnant water, diarrhoea ("ALBATI") during the cold season, common colds ("QUFA") during the dry seasons either because of cold or dust, and pneumonia ("BIRDI") during cold season.

Water access:

The surface water (ponds and dams) get dry during the warm dry season, and communities depending on this source of water have to walk long distance to access water. Hygiene practices are reportedly at their worst during this period since water sources are far and the quantity collected is mainly for drinking purpose.

Ceremonies:

Since for all the ceremonies animals have to be slaughtered, ceremonies are forbidden during the warm dry season and at the end of cold dry season when animals are weak and families have low income.

8.2 HISTORICAL TRENDS OF RISK FACTORS AND UNDERNUTRITION

Historical timelines were generated through discussion with village elders and community members who had been in the village for a long time. The historical timelines for each community visited in the qualitative enquiry are presented from Figure 28 to figure 31. The main evolutions observed were:

- The recurrence of droughts
- The population increase

- The decrease of pasture lands
- The implementation of infrastructures : latrines, schools, road, dams, hand-pump
- The promotion of agriculture and increase of farming lands
- The conflicts between tribes (Moyale woreda)

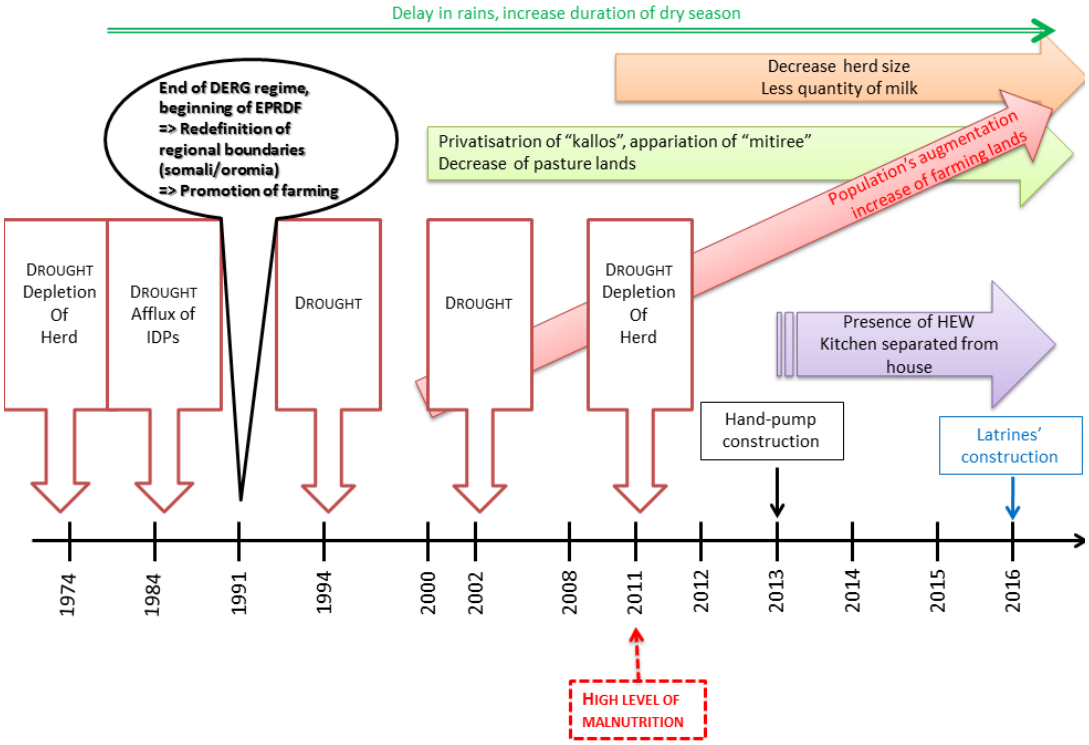


Fig. 28. Historical timeline of Silala, Miyo woreda.

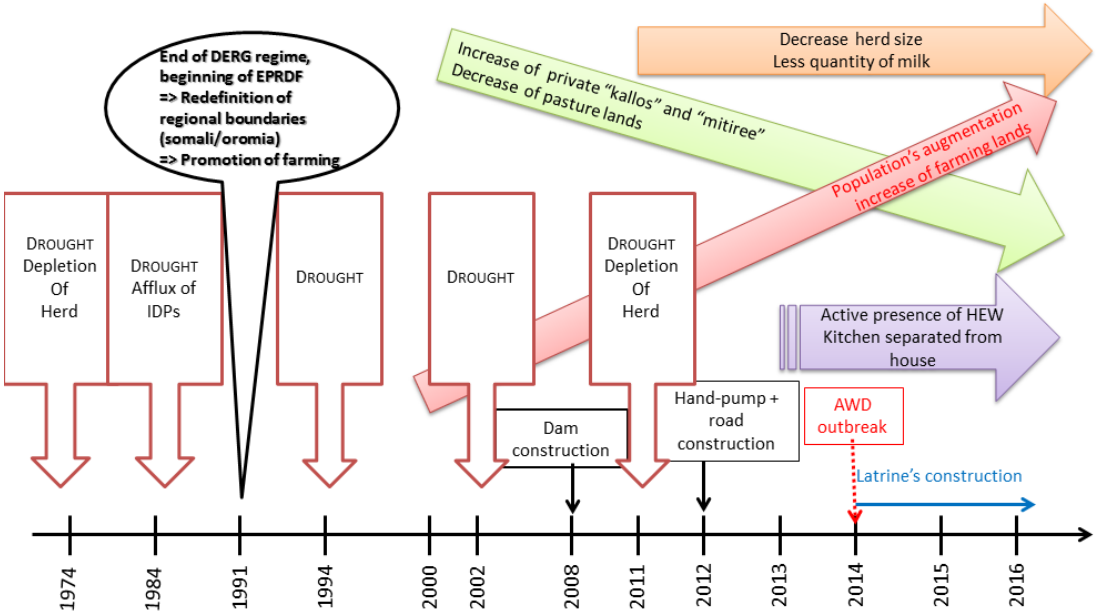


Fig. 29. Historical timeline of Midhaga, Miyo woreda.

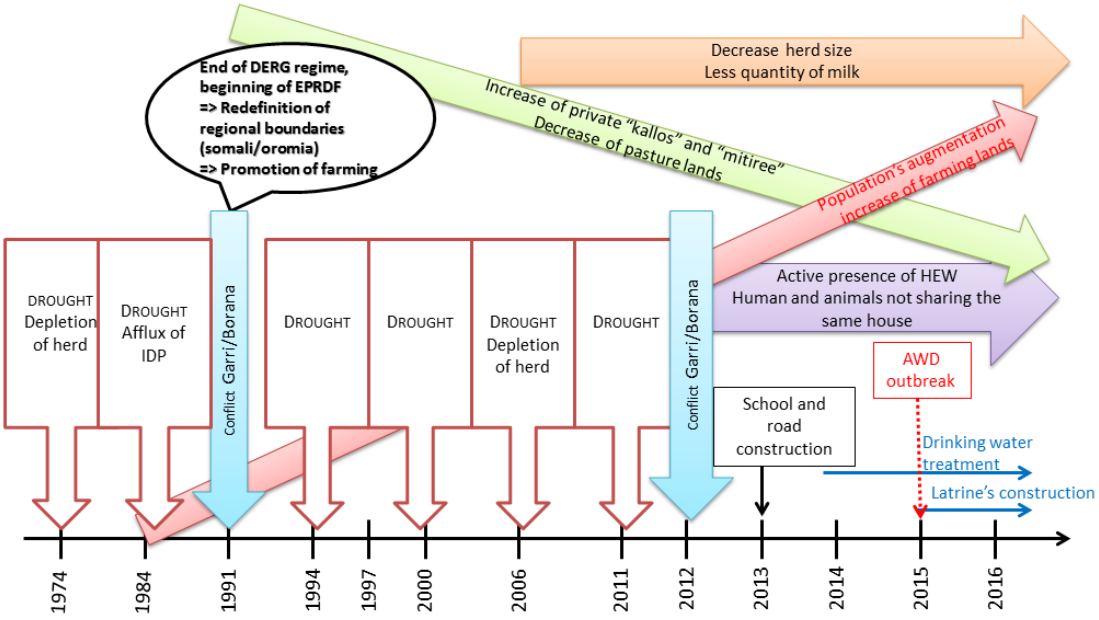


Fig. 30. Historical timeline of Dambi Hora, Moyale woreda.

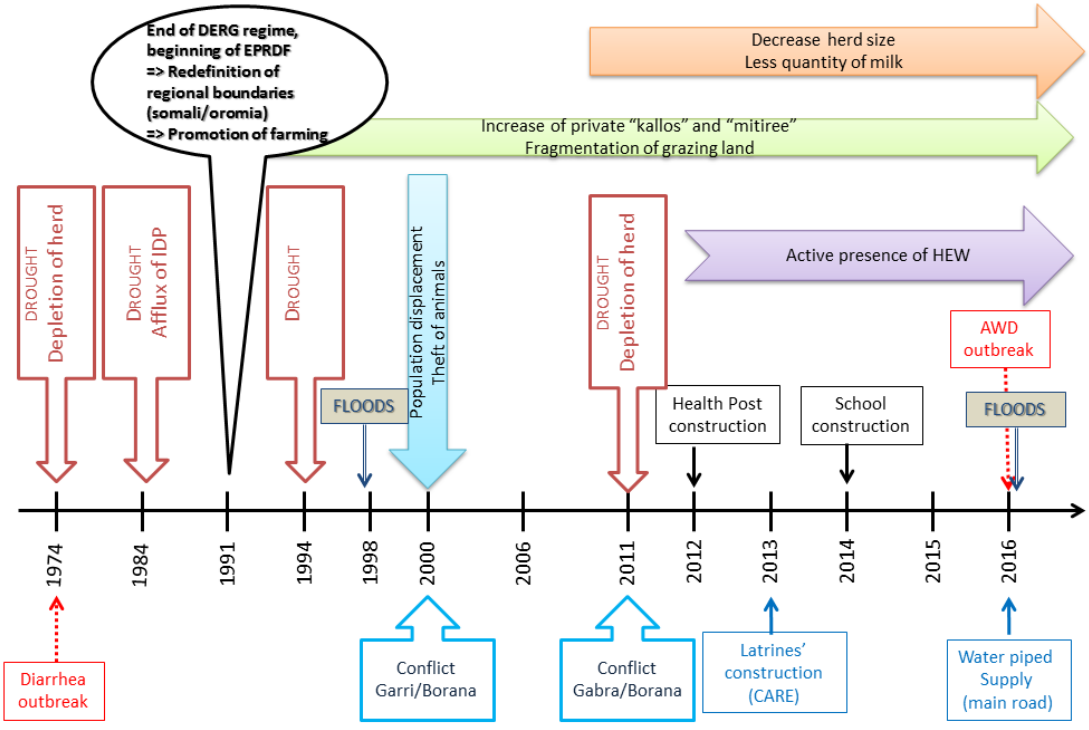


Fig. 31. Historical timeline Harnka Bule, Moyale woreda.

8.3 RECENT SHOCKS

As detailed in the historical timelines for each village (Error! Reference source not found.to Error! Reference source not found.), recent shocks included droughts and less frequently floods.

9/ POSITIVE DEVIANT BEHAVIOURS

In addition to looking at causes of undernutrition, an objective of the qualitative inquiry was to highlight potential 'positive deviant' behaviors within the community. Common positive deviance's definition is based on that "*in every community or organization, there are a few individuals who have found uncommon practices and behaviors that enable them to achieve better solutions to problems than their neighbors who face the same challenges and barriers*"[93].

In order to identify positive deviant behaviors, in-depth interviews were conducted with mothers of well-nourished children, who face the similar constraints than mothers of malnourished children.

9.1 CASE STUDIES

The following case studies of poor mothers with well-nourished children highlight some of these potential positive deviant behaviors.

Case study 1 :

Tume is 28 years old, she is widow since 3 years, and has a "friend". She is from a poor household: she only has 6 cows, 5 goats and 2 sheep, and has no land since she is widow. Her brother-in-law inherited the land of her husband and he sometimes cultivated for her in this land.

She has 5 children (15 years, 12 years, 9 years, 6 years, and the youngest being Qabaalee, a 1 year old girl) and she didn't use any family planning to space the births apart from the traditional one[94]. Her two elders children are living in Kenya with her family-in-law, the three youngest are staying with her in the village.

She planned her last pregnancy with her friend and felt happy when she was pregnant even though she didn't know the sex of the baby. During her last pregnancy she consulted the TBA once and a doctor twice when she was feeling pain in her womb.

[93] ACF, 2014. NCA Guidelines
[94] Borana use a traditional family planning: when women are breastfeeding their child they do not sleep with their husband in order to avoid any sexual relation and then avoid pregnancy.

Following the advices of her deceased husband during her previous pregnancies, she diversified her diet by adding fruits (mangoes and bananas) and rice, and increasing the quantity of food eaten.

All her children were born at home, with the help of the traditional birth attendant of the village, but after the delivery she went to a private clinic for a medical check-up (both for the baby and her) and the baby was vaccinated. As most of the Borana women, after delivery she rest for 7 weeks at home.

The baby was immediately breastfeed since Tume received this advice from her family in Kenya, and exclusively breastfeed for 3 months. After 3 months she compared her daughter with another 3 months old child who was taking breast milk and cow milk and, since that child looked bigger and fatter than her daughter, she decided to complete the baby diet with cow milk. Qabaalee is one year old now and she is still breastfeed. After 6 months she started to feed her baby with soft food as mashed beans and/or mashed potatoes mixed with cow milk. Nowadays the girl is eating family meal but the mother always adds cow milk for her.

The baby had rarely diarrhea, and if she is sick the mother rushed to a private clinic in Mega or Hidi towns where she is sure to find doctors as well as medicines.

To keep her daughter healthy Tume always boils the cow milk before consumption, she washes her child at least once per day with soap if possible, and she tries to play with her and hold her often.

Case study 2 :

Orge is 34 years old; she was married at 15 years and got her first child when she was 21 years old. Her couple is considered as "*GANEDALE*"[95], since they didn't have children soon after the marriage. She has 3 children (a boy of 13 years, a boy of 7 years and Tume, a girl of 2 years old). As most of the women, she didn't use any family planning apart from the traditional one.

Her last pregnancy was planned with her husband. When she was pregnant of 3 months, she consulted a doctor in a private clinic. As she was diagnosed anemic, she was advised to go to the health center every month for a follow-up, and she did it until the delivery. She took iron and vitamin supplementation as recommended by the health center. Her pregnancy was gruelling since she vomited the first 6 months, she felt tired, without appetite, and becoming quickly hungry against her children. She forced herself to eat more than usual and she managed to diversify her diet by adding fruits (mangos, apples, and bananas), vegetables ("kale[96]", amaranth), meat and potatoes. As per the advice of the traditional birth attendant, she avoided to drink milk mixed with water[97] and to eat sugar cane.

She delivered at the health center and breastfed immediately her daughter. During 6 months she practices exclusive breastfeeding, after she introduced cow milk as well as "ugali" (porridge made with maize flour) and continue breastfeeding. When her daughter was 1 and half years, her husband asked her to stop breastfeeding, she agreed. Since then she is feeding her daughter with cow milk, porridge as well as family food.

The child is sometimes having diarrhea when having worms. In that case the mother give her water added with sugar and salt and the same food as usual. She uses to go

[95] "ganedale" : couple which stays long time after marriage without having children. In Borana culture if the couple is "ganedale", the women are blamed since it is assumed that if a couple is not able to have child it is because the woman is infertile.
[96] "Kale" is a kind of local spinach
[97] Borana assume that if a pregnant woman drink milk added with water, her baby will grow fat in her womb and the delivery will be difficult.

to the health center when her daughter is sick but she sometimes lacks of income and she has to borrow money from her neighbors and give back money to them through the sale of a goat.

Orge use to bath her daughter once per day with soap and change the clothes, wash her hands and her daughter's hands before eating. She try to play as much as possible with the little girl in order to make her happy.

Case study 3:

Suba is 28 years, she is widow since 3 years and has a friend. She has 4 children (a boy of 12 years, a girl of 10 years, a girl of 7 years, and Galgalo, a boy of 4 years old) and she is pregnant of 8 months. As most of the Borana women, to space her pregnancies, she didn't sleep with her husband while breastfeeding her children. She planned her last pregnancy with her friend and felt happy when she was pregnant.

When she was pregnant of Galgalo she felt very weak and went to the health center to consult a doctor: she was diagnosed as anemic and was given iron and vitamin supplementation. She also consulted one of the TBAs of the village.

Up to 6 months pregnancy she felt tired, dizzy, without appetite. Her food intake was small (less than usual) and she didn't drink milk added with water (advice given by the TBA) in order to avoid to have a big baby, but she continued taking iron and vitamins.

She gave birth at home, assisted by the TBA, because she was not able to call the ambulance due to lack of network. After delivery she didn't see any doctor, only the TBA.

She didn't breastfeed her son immediately: she first gave him water and "*kumbi*" just after birth and then cow milk. Once the umbilical cord fall down, she started breastfeeding the baby, and gave him cow milk as well. Galgalo was breastfeed during 3 years.

She took 40 days of rest after her delivery, and when she re-started her work, her elder daughter took care of Galgalo in her absence.

When Galgalo was one year she started adding soft food (as rice, mix of mashed maize and beans with milk) to her son's diet.

The child has only diarrhea when his teeth were growing, and the mother gave him water added with salt and sugar and continued breastfeeding him.

To keep her child healthy she boils the water and the cow milk, she washed him every day with soap when he was a baby (up to 1.5 years).

Case study 4 :

Tume is 36 years old, she was married at 23 years and get her first baby at 24 years. She has 5 children (girl of 12 years, boy of 7 years, girl of 5 years, boy of 4 years and, Jarso a boy of 2 years). All her pregnancies were planned with her husband.

When pregnant of Jarso, she went once to the health center because she was falling down often when going to collect firewood. She was diagnosed anemic and was given iron and vitamin supplementation. She was advised to eat eggs, milk and vegetables. She didn't increase her food intake but she tried to diversify her food by eating eggs and vegetables ("*kale*", cabbage, *moringa* leaves) until her delivery.

She felt annoyed during her pregnancy because she was feeling pain and was tired and feeling more irritable.

She wanted to deliver at HC but the ambulance arrived too late and she delivered at home with the help of TBA. Her son was checked up and vaccinated in the village when he was 1 month.

The child was not put at breast immediately, he received first water and kumbi and cow milk until the fall of the umbilical cord. She then started exclusive breastfeeding

until the child was 2 months. At that time she thought she had not enough breastmilk and complete the child' diet with cow milk.

After delivery she rest for 7 weeks and concentrate on her baby : the domestic chores were done by her elder daughter or other women in the village. When she restarted working, the child was fed with cow milk during the day and she breastfed him after work. She started giving him soft food as potatoes and rice as well as mashed beans with maize and milk when he was 1 year and half.

Jarso is still breastfed but the mother plans to stop breastfeeding in the coming weeks because her husband and her want another child.

When the child is having diarrhea she first give him water with sugar and salt, she stops the cow milk but continues the breast milk and she goes to the health post.

9.2 POSITIVE DEVIANT SUMMARY

The PD approach typically involves in-depth observation of potential positive deviant mothers for one day in order to identify positive deviant behaviors, which was unfortunately not within the scope of this NCA. However, from the interviews with potential positive deviant mothers, they were found to share many of the same constraints and negative practices as the mothers with malnourished children: inadequate exclusive breastfeeding and complementary feeding practices, limited access to food and poor diet diversity due to low production and lack of purchasing power, low access to health facilities (distance, cost and unavailability of qualified personnel and medicines). Even if PD mothers try to diversify their children diet, it doesn't means that children needs are met.

The potential positive deviant behaviors identified through the individual interviews could be:

- Ante-natal care consultations
- Iron and vitamin supplementation during pregnancy
- Early initiation of breastfeeding (colostrum intake for the baby)
- Exclusive breastfeeding for at least 3 months
- Diet diversification after 6 months

10/ FINAL RATING EXERCICE

10.1 RATING EXERCISE WITH COMMUNITIES

In order to understand how the community prioritizes the risk factors, a final rating exercise was conducted with the participants of the FGD.

Table 26 shows the results of this exercise, and the perceived top biggest risk factors for each village according to women and to men.

Hypothesis	Silala		Midhaga		Dambi Hora		Bede	
Hyp B : Women workload								
Hyp F : Low women nutritional status prior to pregnancy								
Hyp G : Low mother's intake during pregnancy								
Hyp H : Lack of care during pregnancy								
Hyp I : Lack of family planning								
Hyp J : Low rate of exclusive breastfeeding under 6 months								
Hyp K : Practice of prelacteal feeding								
Hyp L : Inappropriate feeding practices								
Hyp N : Inadequate hygiene practices in the household								
Hyp O : Inadequate access to safe drinking water due to surface water being the main source of water, and long distance (and time) to collect it								
Hyp P : Exposure to poor sanitary conditions / unhealthy environment								
Hyp R : Low income generating opportunities								
Hyp S : Inadequate access to milk and animal products by children and women								
Hyp V : Intra-household food allocation not favoring the women								
	Major contributor to undernutrition							
	Important contributor to undernutrition							
	Minor contributor to undernutrition							

Tab. 26. Rating of causal risk factors by communities.

10.2 INITIAL RATING FROM THE ANALYST

Risk factor	Prevalence from secondary data	Findings from NCA Survey	Strength of association with undernutrition from litterature review	Seasonality of risk factor	Community rating	Results from qualitative survey	Interpretation
A. Low women's decision power	[++]	[++]	[+]	[+]	[+]	[++]	IMPORTANT
B. Women workload	[++]	[++]	[++]	[++]	[+++]	[+++]	MAJOR
C. Low maternal well-being	[+]	[+]	[+]	[+]	[-]	[+]	MINOR
D. Lack of quantity and quality of time spent with children	n/a	[++]	[+]	[++]	[+]	[++]	MINOR
E. Low educational opportunities	[++]	[++]	[++]	[+]	[-]	[++]	MAJOR
F. Low women nutritional status prior to pregnancy	[+]	[++]	[++]	[+]	[++]	[+++]	IMPORTANT
G. Low mother's food intake during pregnancy and lactation	n/a	[++]	[++]	[+]	[++]	[+++]	MAJOR
H. Lack of care during pregnancy	[+]	[+]	[-]	[+]	[++]	[+]	MINOR
I. Low birth spacing/ lack of family planning	[++]	[++]	[++]	[+]	[+++]	[+++]	MAJOR

Risk factor	Prevalence from secondary data	Findings from NCA Survey	Strength of association with undernutrition from litterature review	Seasonality of risk factor	Community rating	Results from qualitative survey	Interpretation
J. Low rate of exclusive breastfeeding under 6 months	[++]	[++]	[++]	[+]	[++]	[+++]	MAJOR
K. Practice of prelacteal feeding	[+++]	[+++]	[++]	[+]	[++]	[+++]	MAJOR
L. Inappropriate complementary feeding practices	[++]	[+++]	[++]	[+]	[+]	[++]	IMPORTANT
M. Low access and quality of health facilities and reliance on traditional medicine	[++]	[++]	[+]	[+]	[+]	[++]	IMPORTANT
N. Inadequate hygiene practices in the household	[+]	[++]	[++]	[++]	[+++]	[+++]	IMPORTANT
O. Inadequate access to safe drinking water due to surface water being the main source of water, and long distance (and time) to collect water	[++]	[++]	[++]	[++]	[+++]	[+++]	MAJOR
P. Exposure to unclean environment	n/a	[++]	[++]	[+]	[+++]	[+++]	IMPORTANT
Q. Low income due to livestock depletion	[+]	[++]	[+]	[++]	[++]	[++]	MINOR
R. Low income generating opportunities	[++]	[++]	[+]	[++]	[++]	[++]	IMPORTANT

Risk factor	Prevalence from secondary data	Findings from NCA Survey	Strength of association with undernutrition from litterature review	Seasonality of risk factor	Community rating	Results from qualitative survey	Interpretation
S. Inadequate access to milk and animal products by children and mothers	n/a	n/a	[++]	[++]	[++]	[++]	IMPORTANT
T. High food access instability	[+]	[+]	[-]	[++]	[-]	[+]	MINOR
U. Lack of food diversification/poor diet diversity	[++]	[++]	[+]	[++]	[-]	[++]	IMPORTANT
V. Intra-household food allocation not favoring the women	[++]	[++]	[+]	[++]	[+++]	[+++]	MAJOR
W. Change in access to pasture	n/a	n/a	n/a	[++]	[++]	[++]	UNTESTED
X. Low level of understanding of nutrition basics	n/a	n/a	[-]	[-]	[-]	[+]	REJECTED
Y. Beliefs and tradition	n/a	[+++]	n/a	[+]	[-]	[+++]	MAJOR

Tab. 27. Preliminary rating by the NCA expert.

10.3 FINAL RATING WITH THE STAKEHOLDER

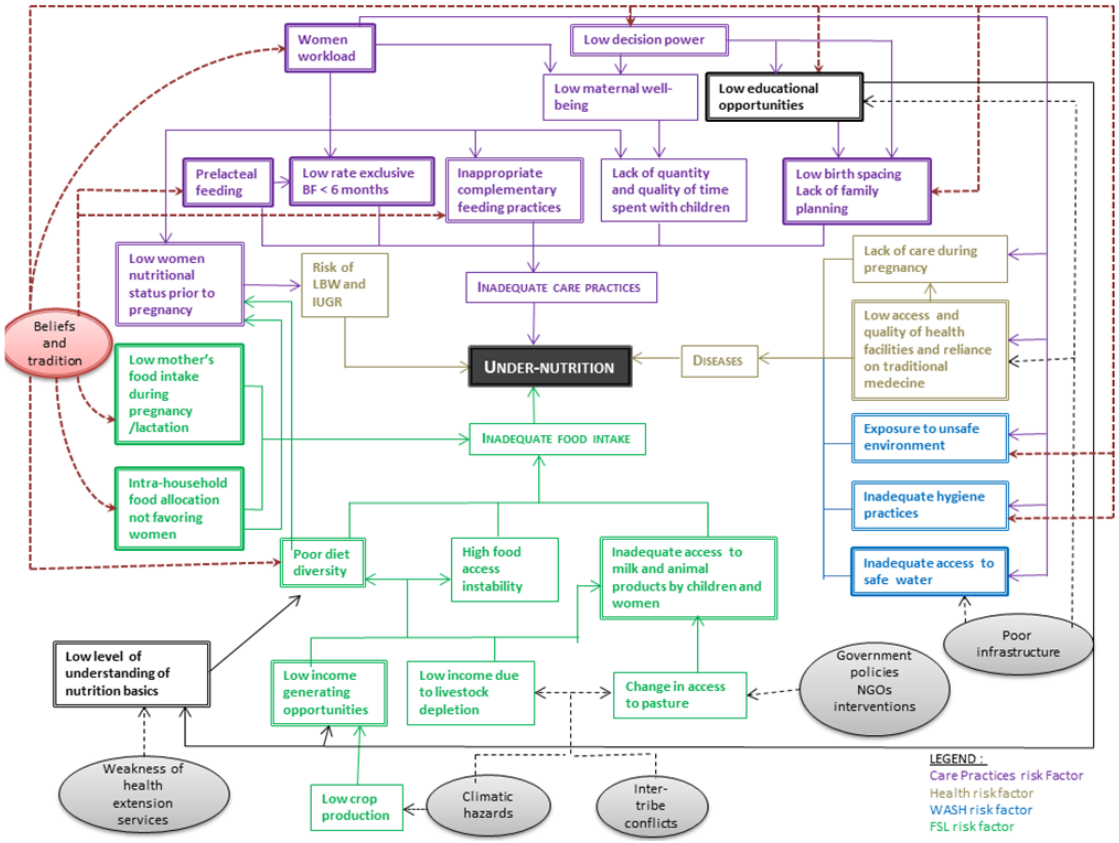
Risk factors	Rating NCA Expert	Average group confidence note	Final rating (validated during the workshop)	Average individual confidence note	Comment from working group
A	IMPORTANT	2.75	IMPORTANT	2.55	
B	MAJOR	3.00	MAJOR	3.00	
C	MINOR	2.50	MINOR	2.05	
D	MINOR	2.50	IMPORTANT	2.40	One group found this rating a bit contradictory with the previous risk factors which are linked with the time spent with children. The risk factor should be rated as “important”, especially for the U6 months children : availability of time spent with the children is very important, especially regarding breastfeeding practices.
E	MAJOR	3.00	MAJOR	2.70	
F	IMPORTANT	2.50	IMPORTANT	2.35	
G	MAJOR	3.00	MAJOR	2.80	
H	MINOR	2.75	MINOR	1.80	
I	MAJOR	2.25	MAJOR	2.50	
J	IMPORTANT	3.00	MAJOR	2.80	This risk factor has a great impact on child-undernutrition and should be

Risk factors	Rating NCA Expert	Average group confidence note	Final rating (validated during the workshop)	Average individual confidence note	Comment from working group
					ranked as « major »
K	MAJOR	3.00	MAJOR	2.65	
L	IMPORTANT	2.50	IMPORTANT	2.40	
M	IMPORTANT	3.00	IMPORTANT	2.65	
N	IMPORTANT	2.50	IMPORTANT	2.55	
O	MAJOR	3.00	MAJOR	2.80	
P	IMPORTANT	2.75	IMPORTANT	2.45	
Q	MINOR	2.50	MINOR	2.05	
R	IMPORTANT	2.75	IMPORTANT	2.45	
S	IMPORTANT	2.75	IMPORTANT	2.45	
T	MINOR	2.50	MINOR	1.95	
U	IMPORTANT	2.50	IMPORTANT	2.55	
V	MAJOR	2.25	MAJOR	2.30	
W	UNTESTED	2.50	UNTESTED	2.20	Although untested, groups felt this was an important risk factor for undernutrition and need further investigation.
X	REJECTED	2.75	IMPORTANT	2.35	This hypothesis should be considered as minor or important instead of being rejected as knowledge about nutrition is a broad concept: IYCF,

Risk factors	Rating NCA Expert	Average group confidence note	Final rating (validated during the workshop)	Average individual confidence note	Comment from working group
					diversification, maternal nutrition etc. The groups agreed to rate it as “Important”.
Y	MAJOR	2.50	MAJOR	2.75	

Tab. 28. Ratings of causal hypotheses from the Final Technical Expert Workshop

11/ LOCAL CAUSAL MODEL



RECOMMENDATIONS

1/ GENERAL PROGRAMME AND POLICY RECOMMENDATIONS

The purpose of the NCA is not to design programmes, though the results should be used to inform programme design decisions. Based on the results of the NCA, several recommendations can be made.

- Prior to implementation of any programme, it is recommended to spend time to ensure community buy-in. Some communities were indeed less inclined to participate in the NCA survey.
- It is recommended to implement an integrated multisectoral response to address these various causes.
- Additionally, an overarching recommendation is the consideration of all caregivers (mothers, fathers, grandmothers, possibly adolescent siblings) for activities to ensure secondary caregivers are improving practices and fathers are supporting wives in good practices.
- In most of the communities, knowledge is not the issue but there are barriers to behaviour change, therefore a Behaviour Change approach (for example the Social Analysis and Action approach from CARE combined with Assisting Behaviour Change Approach from ACF), with strong community participation and considering barriers to behaviour change, should be carefully designed to provide optimal behaviour change, and progress of positive behaviours should be monitored with strategies adapted and improved with operational learning and observations.
- Moreover, education levels are poor in many households and as such interactive and demonstrative tools, adapted to the local context and considering barriers to Behaviour Change, should be used to deliver educational messages. Since pregnant and lactating women are identified as a nutrition vulnerable group, special attention to include them when designing programs should be given.
- As many hypothesis are related to gender issues, gender consideration have to be mainstreamed in project design

Many risk factors showed seasonality – with worse practices during the dry season when workload of women is higher and men move with animals in search of pasture. Several behaviours that are often promoted such as hand washing with soap, treatment of water, using latrines are difficult to implement during this season.

- Timing and location of activities should be carefully thought about to ensure activities have maximum participation without overburdening women. Migration season should also be factored into timings.

The recommendations below present examples of programme activities and the risk factors addressed through these activities. Major risk factors are in **bold and underlined**, important risk factors are in **bold**, minor risk factors are in *italic,* and untested risk factor is in normal text type.

RISK FACTOR TO ADRESS	RECOMMENDATION	BENEFICIARY
Women workload and **Lack of quantity and quality of time spent with children**	Ensure BC approach to favour gender sensitive fair tasks'repartition within the household	HH, community leaders, influencial person
	Support Government offices to include women workload (as major cause of undernutrition) in the care awareness	Government offices
	Ensure BC approach with focus on involvement of fathers in child caring	Fathers, community leaders, influencial person
Low educational opportunities	Ensure BC approach with focus on girls' scholarization	Community, clan leaders, influencial persons
Low mother's food intake during pregnancy and lactation and *Lack of care during pregnancy*	Ensure BC approach with focus on traditional beliefs/practices related to pregnancy and food intake	TBAs, caregivers, influencial persons
	Ensure proper awareness on women' food intake during pregnancy at health facility level	Community
	Awareness raising on importance of women' food intake during pregnancy	TBAs, caregiver
	Promote ANC and PNC as not just when there is a problem	Women, HH
Low birth spacing/ lack of family planning	Ensure BC approach with focus on family planning	Caregivers, fathers, Gadaa leader
	Support Helath Family in family planning initiatives based on gaps identified	Community, HF
	Awareness raising on family planning	Community
Low rate of exclusive breastfeeding under 6 months and **Practice of prelacteal feeding** and **Inappropriate complementary feeding practices**	Support the Health Extension Programme to identify and disseminate adequate messages to communities	Community
	Continue to support Health Facilities' capacity to develop actions to protect, promote and support breastfeeding	Community
	Ensure BC approach with a focus on IYCF taking into consideration cultural beliefs of favouring boys, , including cooking demonstrations	TBAs, caregivers, community, health staff
Inadequate access to safe drinking water due to surface water being the main source of water, and long distance (and time) to collect water	Explore the technical and financial possibility to construct closer safe water delivery points	Community
	Ensure BC approach with focus on protection of water during transportation, treatment and storage to improve safe drinking water at point of use	HH

RISK FACTOR TO ADRESS	RECOMMENDATION	BENEFICIARY
Intra-household food allocation not favoring the women	Ensure BC approach with focus on adequate and fair food intake within household	HH
Beliefs and tradition	Ensure BC approach with focus on IYCF, hygiene practices, intra-household food allocation, food diversification, maternal well-being	TBAs, traditional healers, circumcisers, clan leaders , HH
Low women's decision power and *Low maternal well-being*	Ensure BC approach to favour increased women decision-making	Men, Women, leaders…
	Promote support groups on self-estime, self-efficacy and perception of control	Women
	Ensure BC approach with focus on FGM	TBAs, cirumcisers, traitional healers
Low women nutritional status prior to pregnancy	Awareness raising on links between diet during pregnancy and stunting	Women
Low access and quality of health facilities and reliance on traditional medicine	Support the Health Extension Programme : identification of adequate IYCF messages and tools, capacity building on MAM and SAM management	Community
	Ensure BC approach with focus on health	Community, traditional healers
	Take into account results from HSS study in the design of new programs	Community, Government
Inadequate hygiene practices in the household	Ensure BC approach with focus on hand-washing with soap or equivalent agent at critical times	Households
Exposure to unclean environment	Ensure BC approach with focus on use of latrines, cleaning and maintenance of latrines	Households
	Improve children faeces handling and disposal	Community
	Establish/promote child-friendly play areas, protected from animals and free of faeces, foods and other contaminants on the ground	Caregivers, children, fathers
Low income due to livestock depletion and **Inadequate access to milk and animal products by children and mothers and Low income generating opportunities**	Support small ruminant husbandry : especially animal health (vaccination/deworming in appropriate timing) and fodder storage	Community
	Strengthen the livestock value chain	Communities
	Support IGAs closer to home for primary caregivers	Caregivers
	Improvement of existing crop production through promotion of the utilization of green manure (animal feces)	Households

RISK FACTOR TO ADRESS	RECOMMENDATION	BENEFICIARY
Lack of food diversification/poor diet diversity	Awareness raising on importance of food diversification with establishment of cooking demonstration with food produced or available in the village	Households
	Promotion of micro vegetable gardening, including water efficient methods, use of waste water for plants and natural fertilization (animal feces).	Households
Low level of understanding of nutrition basics	Support the Health Extension program (nutriton package) to increase nutrition awareness in the communities	Communities, Health staff
High food access instability	Improve farming management practices, promote utilization of green manure and drought resistant /short cycle crops	Community
Change in access to pasture	Implement a focused study on the change in access to pasture in order to assess the magnitude and severity of this risk factor and its contribution to undernutrition in the area.	Community

2/ NEXT STEPS

As a follow up to the results of the NCA, it is highly recommended that change in access to pasture is investigated further. Indeed the magnitude and severity of this change has not been clarified and a focused study, possibly in collaboration with the Yabello Pastoral Research Center, could enable to assess this risk factor and its consequences.

ACF has designed a multi-sectorial program funded by EU to be implemented in Borana zone in consortium with CARE and OSHO. The results of the NCA and its recommendations have been integrated to this program.

Further response analysis has to be developed with different stakeholders in order to address the risk factors identified during this study.

CONCLUSIONS

The SMART nutrition survey undertaken in Moyale woreda estimated the GAM prevalence, based on weight-for-height, at 11.3 % [8.9 – 14.2, 95% CI], with Severe Acute Malnutrition (SAM) estimated at 1.7 % [1.0 - 3.1, 95% CI]. According to MUAC, GAM prevalence is 6.0 % [3.9 - 9.2, 95% CI], with 0.7% SAM cases. Even if stunting is well below national and regional it is still at a level of medium prevalence of 25.7% [21.3 – 30.6 95% CI] according to the WHO thresholds. Underweight is at 21.0 [16.0 - 26.9 95% CI} with 4.0% [2.6 – 6.9 95% CI] of children severely underweight, slightly less than regional and national figures.

The Link NCA identified pathways to undernutrition explaining this alarming situation. Analysis from literature review, quantitative and qualitative data, validated by multi-sectorial experts, identified 24 risk factors responsible of child undernutrition in the study area. Nine risk factors were considered as 'major' among whom the high workload of women and Borana' beliefs and traditions negatively affecting the IYCF and hygiene practices as well as maternal well-being and care practices. The inadequate access to safe drinking water was also major factor increasing the risk of undernutrition.

Ten risk factors were considered as 'important' among which low women's decision power, low women nutritional status prior to pregnancy, low access and quality of health facilities and exposure to unclean environment, impacting the nutritional status of children and women.

Four risk factors were considered as 'minor' among which the low income due to livestock depletion and high food instability. One risk factor was not tested and further study on change in access to pasture was recommended.

The Link NCA results provided a number of actionable recommendations to address the identified risk factors for undernutrition in Miyo and Moyale woredas.

ANNEXES

1.1 ANNEXE 1 : LIST OF SAMPLED CLUSTERS FOR SMART/RFS IN MOYALE WOREDA

Kebele	Zone Name	Total Population	Selected Clusters
Danbi	Danbi Sanbate	2793	20
Danbi	Danbi Chame	2192	21
Tilemado	Ola Dabaso	3157	26
Tilemado	Hundacha	3041	27
Melab	Manbarumsa	1380	18
Melab	Bule	1380	19
Tilemado	Tilemado	3732	24,25
kabanawa	Hussien Huka	4039	3
Bede	Ali Sharif	2783	28
Chamuk	Borgudina	1440	29
Chamuk	Firtumisoma	2360	30
kabanawa	Mohammed Galgalo	5488	1,2
kabanawa	Mohammed Guyo	4375	4,5
Shewa Bari	Jirma Wario	4181	6
Shewa Bari	Boru Dida	4253	7,8
Madomigo	Manbarumsa	468	17
Shewa Bari	Roba Dida	4005	9

Mado	Tika Dima	2850	10
Mado	Chana Muda	2304	11
Mado	Bika	2528	12
Hafura	Hamarole	1754	13
Mudhiabmbo	ArdaLoko	754	22
Argane	Dhadacha	3600	23
Tuka	Shewabar	2340	14
Tuka	Ejersa	3290	15,16
Harbale	Wader Tore	328	RC
Danbi	Danbi Hara	2934	RC
Argane	Hundacha	3041	RC
Bede	Harnka Bule	1232	RC

1.2 ANNEXE 2 : LIST OF SAMPLED CLUSTERS FOR RFS IN MIYO WOREDA

Kebele	Village	Total population	Selected cluster
Hidbabo	Hidha babo	1158	10
Cheri Liche	Arda Ballaa	1915	8
Cheri Liche	Biftu Liban	922	9
Melbena	Silala	2005	12,13
Boku Badiya	Dhiri	3206	3,4
Boku Badiya	Dalacha	1781	7
Melbena	Wardele	1221	14
Boku Badiya	Kate	2137	5,6
Melbena	Dugda dima	1842	15

Miyo	Arda jila	1349	17
Beha	Jiresmo	941	1
Beha	Chokorsa	773	2
Hidbabo	Arda loni	1275	11
Miyo	Mulata	1310	16
Cheri Liche	Shanacha	1267	RC
Miyo	Miyo	1306	RC

1.3 ANNEXE 3 : RISK FACTOR SURVEY QUESTIONNAIRE

	I. Identification

To be filled before the interview, before entering in the household

ID.10 - Date of the survey (day/month/year) __/__/____

ID.20 - Number of the cluster (1 to XX):

ID.30 : Woreda (Miyo 01; Moyale 02) : _____

ID.40 - Team ID number (N° 1 to 8):

ID.50 - Household number: ID.51. Name :

ID.60 - Starting time of the interview:

ID.70 – Comments

ID. 80 - Does a child from 0 to 59 months is present in the household? Yes 1 / No 0

If NO, go to the next household. If yes, read the consent form

CONSENT FORM:

My name is _____ and I work with Action Contre la Faim (ACF) an organisation that is fighting against hunger. We would like to invite your household to participate in a study carried out by ACF that is looking at causes of undernutrition in communities of Borana-guji Cattle Pastoral Livelihood zone of Miyo and Moyale woredas.. As a community member, you are in a position to provide us with insight into the situation, and I would appreciate it if we could interview you.

Taking part in this survey is entirely your choice. You do not need to talk to me if you do not want to. And if there is any question you do not want to answer, that will be fine. If you do want to talk with me, I will keep everything that you tell me entirely private and confidential, and will not talk to other people about what you have said. I will also keep you and your family's names confidential, and I will not tell anyone that you have talked to me. Your answers will in no way affect the assistance that any organisation or government agency could provide to your community or your family. If you have any problems, or if you feel uncomfortable answering any question, you should feel free to stop talking with me at any time. I want to tell you that I hope this interview will last about one hour. I want to remind you that all your answers are very important. This is not a test. There are no rights or wrong answers. Therefore, I want to ask you to answer correctly and tell the truth. If you do agree to participate, I will ask you some questions about your household and I will also measure the weight and height of all the children in the household who are younger than 5 years, as well as the women of the household.

If you have additional questions or concerns about this research at any point after you participate in this study, you can contact directly the head of research.

May we have your permission to ask these questions, and would you be willing to participate. Do you have any questions about this study including about what I've just described to you?

ID.90 -Does the household accept the interview? 1=Yes / 0=No

ID.100 – If no, what is the reason?

Signature of Interviewer asserting that consent has been understood and received.

ID.110 Name of Interviewer :_____ Signature of Interviewer _____

II. Introduction

Code	Question	Answer
IN.10	Who is the head of the household?	Man < 18 years 1 Man > 18 years 2 Woman < 18 years 3 Woman > 18 years 4
IN.20	Is the head of household present?	1=Yes 0=No
IN.30	Size of the Household	|_||_| persons
IN.40	Who is the main caregiver of the children under five years old?	1 = Mother 2 = Father 3 = Grandparent 4 = Other (specify) _____
IN.50	What is the marital status of the caregiver?	1 = married /in an union 2 = separated 3 = single 4 = widow
IN.60	Does the mother or the caregiver of the 0-59months child is present?	1=Yes 0=No
IN.70	**If no to IN.60** I would like to ask few questions to the caregiver of the child, at what time could we come back?	_ _ : _ _ AM/PM

III. Food Security and Livelihood (FSL)

FS.10	In your household, who eat first?	1 = all the members at the same time 2 = children first 3 = father/men first 4= mother/women 5 = both father and mother
FS.20	In your household, who eat second?	1 = children 2 = father/men 3= mother/women 4 = both father and mother
FS.30	In your household, who eat last?	1 = children 2 = father/men 3= mother/women 4 = both father and mother

- **Household Dietary Diversity Score (HDDS) and associated Household food sources (HFS)**

Food sources (DO NOT PROBE)

Market = 1; Own production = 2

Social networks/gift = 3; Exchange/barter = 4

Gathering wild foods and hunting = 5; Humanitarian aid/Food assistance = 6

Loan = 7; Productive Safety Net Programme (PSNP) = 8

	Now I would like to ask you about the types of foods that you or anyone else in your household ate yesterday during the day and at night. Since yesterday morning till this morning what are the food eaten in your household?	Yes	No
HDDS.10	Any injera, bread, rice, noodles, biscuits, kolo, or any other foods made from millet, sorghum, maize, rice, wheat or teff?	1	0

AFS.10	Where did you find this food?		
HDDS.20	Any potatoes, yams, cassava or any other foods made from roots or tubers?	1	0
AFS.20	Where did you find this food?		
HDDS.30	Any vegetables?	1	0
AFS.30	Where did you find this food?		
HDDS.40	Any fruits?	1	0
AFS.40	Where did you find this food?		
HDDS.50	Any beef, goat, camel, lamb, or birds, liver, kidney, heart, or other organ meats?	1	0
AFS.50	Where did you find this food?		
HDDS.60	Any eggs?	1	0
AFS.60	Where did you find this food?		
HDDS.70	Any fresh or dried fish or shellfish?	1	0
AFS.70	Where did you find this food?		
HDDS.80	Any foods made from beans, peas, lentils or nuts?	1	0
AFS.80	Where did you find this food?		
HDDS.90	Any cheese, yogurt, milk, or other milk products?	1	0
AFS.90	Where did you find this food?		
HDDS.100	Any foods made with oil, fat or butter?	1	0
AFS.100	Where did you find this food?		
HDDS.110	Any sugar or honey?	1	0
AFS.110	Where did you find this food?		
HDDS.120	Any other foods, such as condiments, berbere, spices, coffee, tea?	1	0
AFS.120	Where did you find this food?		

- **Months of Adequate Food Provisioning (MAHFP)**

DO NOT READ THE LIST OF MONTHS ALOUD.
Use a seasonal calendar if needed to help respondent remember the different months. Probe to make sure the respondent has thought about the entire past 12 months.
If MAHFP.10 answer is No, then No to MAHFP.20 to MAHFP.130

MAHFP.10	**Now I would like to ask you about your household's food supply during different months of the year. When responding to these questions, please think back over the last 12 months, from now to the same time last year. Were there months, in the past 12 months, in which you did not have enough food to meet your family's needs?**	**Yes 1**	**No 0**
If YES, which were the months in the past 12 months during which you did not have enough food to meet your family's needs? This includes any kind of food from any source, such as own production, purchase or exchange, food aid or borrowing			
MAHFP.20	March 2016	1	0
MAHFP.30	February 2016	1	0

MAHFP.40	January 2016	1	0
MAHFP.50	December 2016	1	0
MAHFP.60	November 2016	1	0
MAHFP.70	October 2016	1	0
MAHFP.80	September 2016	1	0
MAHFP.90	August 2016	1	0
MAHFP.100	July 2016	1	0
MAHFP.110	June 2016	1	0
MAHFP.120	May 2016	1	0
MAHFP.130	April 2016	1	0

- **Assets, land and livestock**

Now, I would like to ask you which livestock/land do you own and how many of each		Number
ALL.10	Lactating cow	
ALL.20	Dry cow	
ALL.30	Calves	
ALL.40	Bull	
ALL.50	Ox	
ALL.60	Lactating goat	
ALL.70	Dry goat	
ALL.80	Billy goat	
ALL.90	Lactating ewe (she-sheep)	
ALL.100	Dry ewe(she-sheep)	
ALL.110	Lamb	
ALL.120	Ram	
ALL.130	Lactating she-camel	
ALL.140	Dry she-camel	
ALL.150	Baby camel	
ALL.160	Camel	
ALL.170	Donkey/horse	
ALL.180	Small plot garden (in timat / sangatok)	_ _

ALL.190	Subsistence crops (in timat / sangatok)	_ _
ALL.200	Cash crops (in timat / sangatok)	_ _

Now, I would like to ask you if your household own a land. If yes, what is the total surface area of the land that you are farming/gardening for (***probe***)?

If one land is used for different farming, write the surface area accordingly to what is farmed. If no land, then 0

LAND.10	Surface area MAIZE/HARICOT BEAN	_____ (timat / sangatok)
LAND.11	Surface area WHEAT	_____ (timat / sangatok)
LAND.12	Surface area TEFF	_____ (timat / sangatok)
LAND.13	Surface area FRUITS	_____ (timat / sangatok)
LAND.14	Surface area KHAT	_____ (timat / sangatok)
LAND.15	Surface area VEGETABLES	_____ (timat / sangatok)

IV. Unhealthy environment

All these questions are for DOMESTIC USE OF WATER and do not include water for animals

UE.10	What is the main source of drinking water for your household during the RAINY SEASON? (One choice) *(Present a map with the different water points that have been assessed)* *Coding key: to be determined according to the setting and map.* *Circle 1 to 5 and write the letter code*	1 = Groundwater: open well, *ellas*, well/borehole with hand-pump, well/borehole with motorized pump system 2 = Roof rainwater 3 = Piped supply 4 = Surface water as ponds 5 = Other (specify) _____ For answer 1 to 4, letter code of the source _
UE.11	How much time does it take on average to go to the drinking water source during RAINY SEASON, get water, and come back? If the participant gets water at home, then X	1 = 30 minutes or less 2 = 31 to 60 minutes 3 = 61 to 180 minutes 4 = more than 3 hours 5 = Does not know X = not applicable
UE.12	What is the main source of drinking water for members of your household during the DRY SEASON ? (One choice) *(Present a map with the different water points that have been assessed)* *Coding key: to be determined according to the setting and map.* *Circle 1 to 5 and write the letter code*	1 = Groundwater: open well, *ellas*, well/borehole with hand-pump, well/borehole with motorized pump system 2 = Roof rainwater 3 = Piped supply 4 = Surface water as ponds

		5 = Other (specify) _____ For answer 1 to 4, letter code of the source _
UE.13	How much time does it take on average to go to the drinking water source during RAINY SEASON, get water, and come back? If the participant gets water at home, then X	1 = 30 minutes or less 2 = 31 to 60 minutes 3 = 61 to 180 minutes 4 = more than 3 hours 5 = Does not know X = not applicable

What do you usually do to make the water safer to drink? Probe: Anything else? (record all items mentioned)		**Quoted**	**Not quoted**
UE.20	Boil	1	0
UE.21	Add bleach/chlorine	1	0
UE.22	Use water filter (ceramic, sand, composite etc.)	1	0
UE.23	Solar disinfection	1	0
UE.24	Strain it through a cloth	1	0
UE.25	Let it stand and settle	1	0
UE.26	Other	1	0

Now I would like to ask some questions about sanitation.			
UE.30	Is there a toilet or latrine in the household? If no, skip toUE. 40	Yes = 1	No = 0
UE.31	Do you use this toilet/latrine? If yes: May I see it please? (refer to the observation part) and skip to UE.50	Yes = 1	No = 0
UE.40	Where do you usually relieve yourself? If answer is 1 or 2: May I see it please? (refer to the observation part)	1 = Relatives' latrines/toilets 2 = Public latrines/toilets 3 = No facilities/bush/trees	
UE.50	How many people, aged more than 12 months, of your HH are using the toilet/latrine?	_ _	
UE.60	How many people are aged more than 12 months in your HH?	_ _	

When do you usually wash your hands? (DO NOT PROBE)			
UE.70	After defecation		0
UE.71	After cleaning babies' bottom		0
UE.72	Before food preparation		0

UE.73	Before eating		0
UE.74	Before feeding children (including breastfeeding)		0
UE.75	Other (specify) :		
Would you explain and show me what you do when you wash your hands? **Ask the participant to show how he/she wash his/her hands.**			
UE.80	Uses water		
UE.81	Uses soap or ashes		
UE.82	Washes both hands		
UE.83	Rubs hands together at least three times		
UE.84	Dries hands hygienically by air-drying or using a clean cloth		

UE.85	Do you have any soap in your household for washing hands?	Yes = 1	No = 0
UE.86	If yes: Can you please show it to me?	Not able to show = 1 Bar soap = 2 Detergent (powder/liquid/paste) = 3 Liquid soap = 4	

V. Child Questionnaire

Fill this part for each child under 59 months old in the HoH. To find the age, use the event calendar.

Fill part A and B for child 0-23 months.

Fill part B for child 0-59 months.

Code	Questions	Answers
ID.200	Name of selected child	
ID.210	Identification of the child (team ID No/ Cluster No/HH No / child No)	____ / ____ / ____ / ____
ID.220	Birth date If the birth date is not known, ask question ID.230	Birth date __/__/____ Don't know X
ID.230	Calculate immediately in months, if the birth date is known Otherwise use the event calendar to define the age	___ Months
ID.240	Source for obtaining age	Birth certificate = 1 Event Calendar = 2
ID.250	Sex of selected child	Male = 1 Female = 2

A. Child 0-23 months

Now I would like to ask some question about your child.				
CP.10	Has (**name**) ever been breastfed? If don't know, skip to question CP.20	Yes 1	No 0	Don't know 99
CP.11	How long after birth did you first put (**name**) to the breast? **(Probe)** If respondent reports she put the infant to the breast immediately after birth, circle '000' for 'immediately'. If less than one hour, circle '1' for hours and record '00' hours. If less than 24 hours, circle '1' and record number of completed hours, from 1 to 23. Otherwise, circle '2' and record number of completed days.	Immediately.....000 Or: Hours:.....1 |_||_| Or: Days.....2 |_||_|		
CP.20	Was (**name**) breastfed yesterday during the day or at night?	Yes 1	No 0	Don't know 99
CP.21	Sometimes babies are fed breast milk in different ways, for example by spoon, cup or bottle. This can happen when the mother cannot always be with her baby. Sometimes babies are breastfed by another woman, or given breast milk from another woman by spoon, cup or bottle or some other way. This can happen if a mother cannot breastfeed her own baby. Did (**name**) consume breast milk in any of these ways yesterday during the day or at night?	Yes 1	No 0	Don't know 99

Next, I would like to ask you about some liquids that (name) may have had yesterday during the day or at night. Did (name) have any:		**Yes**	**No**	**Don't know**
CP.30	Plain water?	1	0	99
CP.31	Infant formula such as (INSERT LOCAL EXAMPLES)?	1	0	99
CP.32	Milk such as tinned, powdered, or fresh animal milk?	1	0	99
CP.33	Juice or juice drinks?	1	0	99
CP.34	Clear broth?	1	0	99
CP.35	Yogurt?	1	0	99

CP.36	Thin porridge?	1	0	99
CP.37	Any other liquids such as (LIST OTHER WATER-BASED LIQUID AVAILABLE IN THE LOCAL SETTING)?	1	0	99
CP.38	Any other liquids?	1	0	99

How many times yesterday during the day or at night did (*name*) consume any (item from list)?		
CP.40	Infant formula such as (insert local examples)?	Times B: |_||_|
CP.41	Milk such as tinned, powdered, or fresh animal milk?	Times C: |_||_|
CP.42	Thin porridge?	Times F: |_||_|

CP.50	Did (name) eat any solid, semi-solid, or soft foods yesterday during the day or at night?	Yes 1	No 0	Don't know 99
CP.51	How many times did (**name**) eat solid, semi-solid, or soft foods other than liquids yesterday during the day or at night?	Number of times: |_||_| Don't know = 99		

Please describe everything that (name) ate yesterday during the day or at night, whether at home or outside the home. Please, think about when (name) eat yesterday from the time he/she woke up yesterday morning, till the time he/she woke up that morning, at home or outside.

Think about the time he/she woke up yesterday. Did (name) eat anything when he/she woke up?
IF YES: Tell me everything (name) ate at that time.
Continue till the person answers "nothing else".

What did (name) do after that? Did he/she eat something at that time?
IF YES: What did (name) eat at that time? Anything else?
Continue till the person answers "nothing else". Repeat the question until the respondent says the child went to sleep until the next day (this morning weak up).

If the participant mentions mix dishes, like porridge, sauce, stew…, **ask: "what ingredients were in that (mixed dish)? Anything else?"**
Tick all the food category related to the mix dishes. If the food is not listed in any of the food groups below, write the food in the bow labelled "other foods". If foods are used in small amounts for seasoning or as a condiment, include them under the condiment food group.

Once the respondent finishes recalling foods eaten, read each food group where "1" was not circled, ask the following question and circle "1" if respondent says yes, "0" if no and "X" if don't know.

Yesterday, during the day or night, did (name) drink/eat any (food group items)?		**Yes**	**No**	**Don't know**
IDDS.210	Porridge, injera, bread, rice, noodles, or other foods made from grains/cereals such as rice, millet , teff,etc.	1	0	99
IDDS.220	Pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside	1	0	99
IDDS.230	White potatoes, white yams, manioc, cassava or any other foods made from roots	1	0	99
IDDS.240	Any dark green leafy vegetables as spinach, *kale*, bean greens…	1	0	99
IDDS.250	Ripe mangoes, ripe papayas, or (insert other local Vitamin A-rich fruits)	1	0	99
IDDS.260	Any other fruits or vegetables?	1	0	99
IDDS.270	Liver, kidney, heart or other organ meats?	1	0	99
IDDS.280	Any meat, such as beef, camel, lamb, goat, chicken	1	0	99

IDDS.290	Eggs	1	0	99
IDDS.300	Fresh or dried fish, shellfish, or seafood	1	0	99
IDDS.310	Any foods made from beans, peas, lentils, nuts or seeds	1	0	99
IDDS.320	Cheese, yogurt or other milk products	1	0	99
IDDS.330	Any oil, fats, butter, or foods made with any of these	1	0	99
IDDS.340	Any sugary foods such as chocolates, sweets, candies, pastries, cakes, or biscuits?	1	0	99
IDDS.350	Condiments for flavour, such as chillies, spices, herbs, fish powder?	1	0	99
IDDS.360	Any grubs, snails or insects?	1	0	99
IDDS.370	Foods made with red palm nut or red palm nut pulp sauce	1	0	99

H.10	Has (name) had diarrhoea (more than 3 loose or watery stools in a 24-hour period) in the past two weeks?	Yes 1	No 0	Don't know 99
H.20	Has (name) had an illness with a cough (trouble breathing or breathe faster than usual with short, quick breaths) in the past two weeks?	Yes 1	No 0	Don't know 99

UE.90	The last time (name) passed stool, where did he/she defecate?	1 = Used potty 2 = Used washable diaper 3 = Used disposable diapers 4 = Went in his/her clothes 5 = Went in house/yard 6 = Went outside the premises 7 = Used own sanitation facility 8 = Used public latrine 9 = Other 99 = Don't know
UE.100	The last time *(name)* passed stool, where were his/her faeces disposed?	1 = Dropped into toilet facility 2 = Buried 3 = Solid waste/trash 4 = In yard 5 = Outside premises 6 = Public latrine 7 = Into sink or tub 8 = Thrown into waterway 9 = At the well 10 = Thrown elsewhere (ask to specify) 11 = Washed/rinsed away (ask to specify) 99 = Not applicable

Now I would like to ask you some question regarding your relation with (name)				
MC.10	In the past 3 days, did you or any household member over 15 years of age engage in story telling, singing or playing with (name)?	Yes 1	No 0	Don't know 99
MC.20	Do you leave (name) alone or in the care of other children younger than 12 years of age?	Yes 1	No 0	
MC.30	If yes, how often?	1 = Every day 2 = Several times a week 3 = Less than once a week 99 = Not applicable		

Now, I would like to ask you some question about (name) when she/he born		
LBW.10	When (name) was born, was he/she very large, larger than average, average, smaller than average, or very small?	1 – Very Large 2 – Larger than average 3 – Smaller than average 4 – Very Small 5 – Average size 6 – Don't remember 99 – Don't know

RH.10	Does (name) have a younger sibling? **If no, ask caregiver questionnaire**	Yes 1	No 0
RH.11	If yes, what is the age difference between (**name**) and his/her direct younger sibling? **Use the event calendar** **If don't know, ask RH.12** **If answered, ask next questionnaire**	_ _ months 99 Don't know	
RH.12	If don't know, what is the age of his/her direct younger sibling? **Use the event calendar**	_ _ months	

B. Child 24-59 months

Please describe everything that (name) ate yesterday during the day or at night, whether at home or outside the home. Please, think about when (name) eat yesterday from the time he/she woke up yesterday morning, till the time he/she woke up that morning, at home or outside.

Think about the time he/she woke up yesterday. Did (name) eat anything when he/she woke up?
IF YES: Tell me everything (name) ate at that time.
Continue till the person answers "nothing else".

What did (name) do after that? Did he/she eat something at that time?
IF YES: What did (name) eat at that time? Anything else?
Continue till the person answers "nothing else". Repeat the question until the respondent says the child went to sleep until the next day (this morning weak up).

If the participant mentions mix dishes, like porridge, sauce, stew…, **ask: "what ingredients were in that (mixed dish)? Anything else?"**
Tick all the food category related to the mix dishes. If the food is not listed in any of the food groups below, write the food in the bow labelled "other foods". If foods are used in small amounts for seasoning or as a condiment, include them under the condiment food group.

Once the respondent finishes recalling foods eaten, read each food group where "1" was not circled, ask the following question and circle "1" if respondent says yes, "0" if no and "X" if don't know.

Yesterday, during the day or night, did (name) drink/eat any (food group items)?		Yes	No	Don't know
IDDS.210	Porridge, injera, bread, rice, noodles, or other foods made from grains/cereals such as rice, millet , teff,etc.	1	0	99
IDDS.220	Pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside	1	0	99
IDDS.230	White potatoes, white yams, manioc, cassava or any other foods made from roots	1	0	99
IDDS.240	Any dark green leafy vegetables as spinach, *kale*, bean greens…	1	0	99
IDDS.250	Ripe mangoes, ripe papayas, or (insert other local Vitamin A-rich fruits)	1	0	99
IDDS.260	Any other fruits or vegetables?	1	0	99
IDDS.270	Liver, kidney, heart or other organ meats?	1	0	99
IDDS.280	Any meat, such as beef, camel, lamb, goat, chicken	1	0	99
IDDS.290	Eggs	1	0	99
IDDS.300	Fresh or dried fish, shellfish, or seafood	1	0	99
IDDS.310	Any foods made from beans, peas, lentils, nuts or seeds	1	0	99
IDDS.320	Cheese, yogurt or other milk products	1	0	99
IDDS.330	Any oil, fats, butter, or foods made with any of these	1	0	99
IDDS.340	Any sugary foods such as chocolates, sweets, candies, pastries, cakes, or biscuits?	1	0	99
IDDS.350	Condiments for flavour, such as chillies, spices, herbs, fish powder?	1	0	99
IDDS.360	Any grubs, snails or insects?	1	0	99
IDDS.370	Foods made with red palm nut or red palm nut pulp sauce	1	0	99

CP.100	Does anyone help (name) to eat?	Yes 1	No 0	Don't know X
CP.110	What do you do when (name) refuses to eat? Categorize answer into the positive, negative or no reaction	1 = Nothing (the child is left alone) 2 = Other (coax, play with, change food) 3 = Force		

H.30	Has (name) had diarrhoea (more than 3 loose or watery stools in a 24-hour period) in the past two weeks?	Yes 1	No 0	Don't know 99
H.40	Has (name) had an illness with a cough (trouble breathing or breathe faster than usual with short, quick breaths) in the past two weeks?	Yes 1	No 0	Don't know 99
UE.110	The last time (name) passed stool, where did he/she defecate?	1 = Used potty 2 = Used washable diaper		

		3 = Used disposable diapers 4 = Went in his/her clothes 5 = Went in house/yard 6 = Went outside the premises 7 = Used own sanitation facility 8 = Used public latrine 9 = Other 99 = Don't know
UE.120	The last time *(name)* passed stool, where were his/her faeces disposed?	1 = Dropped into toilet facility 2 = Buried 3 = Solid waste/trash 4 = In yard 5 = Outside premises 6 = Public latrine 7 = Into sink or tub 8 = Thrown into waterway 9 = At the well 10 = Thrown elsewhere (ask to specify) 11 = Washed/rinsed away (ask to specify) 99 = Not applicable

LBW.20	When (name) was born, was he/she very large, larger than average, average, smaller than average, or very small?	1 – Very Large 2 – Larger than average 3 – Smaller than average 4 – Very Small 5 – Average size 6 – Don't remember 99 – Don't know

Now I would like to ask you some question regarding your relation with (name)				
MC.40	In the past 3 days, did you or any household member over 15 years of age engage in story telling, singing or playing with (name)?	Yes 1	No 0	Don't know 99
MC.50	Do you leave (name) alone or in the care of other children younger than 12 years of age?	Yes 1	No 0	
MC.60	If yes, how often?	1 = Every day 2 = Several times a week 3 = Less than once a week 99 = Not applicable		

OBSERVATIONS Child 0-59 months **To be filled at the end of the questionnaire**	
Child observation	

	Look at the child and observe how clean he/she is? *The child is clean (relatively recently the child has been cleaned or washed)* *The child is medium (child's hands and /or clothes are dirty but no feces visible or can be smelled).* *Very dirty (stools are visible or can be smelt on the child's body or clothes)*	1 = Child is clean 2 = Medium clean 3 = Very dirty	
Caregiver-child interaction observation:			
	Caregiver tends to keep the child within visual range and looks at the child quite often		
	Caregiver talks to the child during the course of the visit		
	Caregiver interacts with child to promote development and learning		
	Caregiver smiles at the child, laughs with the child, caresses, kisses or hugs the child		
	Caregiver spanked or hit the child during the visit, or shouted or yelled at him/her.		

VI. Main caregiver questionnaire

Now I would like to ask you questions about yourself			
CG.10	How old are you?	_ _ years	
CG.11	Source	1 = Caregiver's statement 2 =Birth certificate	
CG.20	Did you go to school?	Yes 1	No 0
CG.21	What is the highest grade or level at school you completed?	Grade: |_||_|	

Now I would like to measure your MUAC (Mid-Upper Arm Circumference) using this tape. It is safe, non-harmful and will take only few minutes.		
ANT.10	MUAC in millimetre	_ _ _ mm

Yesterday, during the day or night, did you drink/eat any of the following food items?		**Yes**	**No**	**Don't know**
IDDS.210	Porridge, injera, *firfir*, bread, rice, noodles, or other foods made from grains/cereals such as rice, millet, teff, etc.	1	0	99
IDDS.220	Pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside	1	0	99
IDDS.230	White potatoes, white yams, manioc, cassava or any other foods made from roots	1	0	99
IDDS.240	Any dark green leafy vegetables as spinach, *kale*, bean greens…	1	0	99
IDDS.250	Ripe mangoes, ripe papayas, or (insert other local Vitamin A-rich fruits)	1	0	99
IDDS.260	Any other fruits or vegetables?	1	0	99
IDDS.270	Liver, kidney, heart or other organ meats?	1	0	99
IDDS.280	Any meat, such as beef, camel, lamb, goat, or chicken	1	0	99
IDDS.290	Eggs	1	0	99
IDDS.300	Fresh or dried fish, shellfish, or seafood	1	0	99
IDDS.310	Any foods made from beans, peas, lentils, nuts or seeds	1	0	99
IDDS.320	Cheese, yogurt or other milk products	1	0	99
IDDS.330	Any oil, fats, butter, or foods made with any of these	1	0	99
IDDS.340	Any sugary foods such as sugar, chocolates, sweets, candies, pastries, cakes, or biscuits?	1	0	99
IDDS.350	Condiments for flavour, such as chillies, spices, herbs, fish powder?	1	0	99
IDDS.360	Any grubs, snails or insects?	1	0	99
IDDS.370	Foods made with red palm nut or red palm nut pulp sauce	1	0	99

CG. 30	How old were you when your get married?	__ __ years
DP.10	Who decides whether the children should go to school	1 = Mother 2 = Father 3 = Both 4 = Other (specify) _____
DP.20	Who decides when the child has to consult medical services?	1 = Mother 2 = Father 3 = Both 4 = Other (specify) _____

DP.30	Who decides how to spend the household's money	1 = Mother 2 = Father 3 = Both 4 = Other (specify) _____
DP.40	Who decides if or when to have other children	1 = Mother 2 = Father 3 = Both 4 = Other (specify) _____

FOR WOMEN FROM 15 TO 49 YEARS OLD MARRIED OR IN AN UNION

CG.40	Are you currently doing something or using any method, including sterilization, to delay or avoid getting pregnant? If no, skip to **CG. 50**	Yes 1	No 0	
CG.41	If yes, What are you doing to delay or avoid a pregnancy? Do not probe Multiple answers can be accepted	1 = Female/male sterilization 2 = IUD 3 = Injectable 4 = Implants 5 = Foam/gelly 6 = Contraceptive Pill 7 = Male/female condom 8 = Diaphragm 9 = Lactational amenorrhea method 10 = Withdrawal method 11 = Calendar method 12 = Other (specify)		
CG.50	How old were you when you gave birth for the first time?	_ _ years		
CG.60	At the time of your last pregnancy, did you want to become pregnant then, did you want to wait until later, or did you want no more children at all?	1 = Then 2 = Later 3 = Not at all		
CG.70	Did you take some rest after your most recent delivery? If yes, how many days?	0 = No 1 = Yes Number of days of rest : _____		
CG.80	Did you eat more/less/same amount as usual when you were pregnant or breastfeeding?	1 = More 2 = Less 3 = Same		
CG.90	In general, do you feel supported from members of your community or your household? If yes, probe how much: (*Include all kind of support such as financial, social etc. Do not probe, this question is left to the understanding of the mother*)	1 = Extremely 2 = Somewhat 3 = Not very 4 = Not at all		
CG.100	Do you feel you have too much work to take care of your child?	Yes = 1 No = 0		

Please indicate for each of the five statements, which is closest to how you have been feeling over the last two weeks.

Example: If the respondent has felt cheerful and in good spirits more than half of the time during the last two weeks, put a tick in the box with the number 3.

Over the last two weeks:			More tha	Less than half of the	Some of the time	At no

				nhalfofthetime	time		time
WHO5.10	I have felt cheerful and in good spirits			3	2	1	0
WHO5.20	I have felt calm and relaxed			3	2	1	0
WHO5.30	I have felt active and vigorous			3	2	1	0
WHO5.40	I woke up feeling fresh and rested			3	2	1	0
WHO5.50	My daily life has been filled with things that interest me			3	2	1	0
TOTAL (calculate immediately by summing up all answers)							

H.50	Did you see anyone for Antenatal care for your last pregnancy? If no, tick 5 “no one”, then ask H.100	1 = Health professional (Doctor, nurse/midwife, auxiliary midwife) 2 = Traditional birth attendant such as

	If yes, "Whom did you see?" Probe "Anyone else?" till the respondent answer "no one else" Probe for the type of person seen and tick all answers given.	"INSERT LOCAL NAME", traditional healer such as "INSERT LOCAL NAME", Community health worker 3 = Relative/friend 4 = Other (specify) 5 = No one
H.60	How many times did you see someone for Antenatal care?	Number of times: |_||_|
H.70	Did you see anyone for Post-natal care after your last delivery?	1 = Health professional (Doctor, nurse/midwife, auxiliary midwife) 2 = Traditional birth attendant such as "INSERT LOCAL NAME", traditional healer such as "INSERT LOCAL NAME", Community health worker 3 = Relative/friend 4 = Other (specify) 5 = No one
H.80	How many times did you see someone for Post-natal care?	Number of times: |_||_|

	H. 90. What are your main barriers from going to the health centre when someone is sick? Do not probe, multiple answers accepted		
H.91	Money/cost	1	0
H.92	Time		
H.93	Transportation means		
H.94	Geographical distance		
H.95	Decision power		
H.66	The service is not good enough		
H.97	Culture (specify)		
H.98	Other (specify)		
H.99	No barriers		

VII. Water point observation

Refer to question UE.10 "What is the main source of drinking water for members of your household?" and fill accordingly (1 to 4):
According to question UE.10, go to the correspondent water point and answer to the correct questionnaire (if UE.10 answer is 1, then fill the questionnaire 1, if answer is 2 fill questionnaire 2, if answer is 3 fill questionnaire 3, if answer is 4 fill questionnaire 4)

	1. Groundwater: ***ella***, ***tulla***, open well, well/borehole with hand pump, well/borehole with motorized pump system, ground water catchment:	No	Yes
G.10	Is there a latrine or any source of pollution within 30 m of the well?	0	1
G.20	Does the fence around the well allow animals in? If there is no	0	1

	fence, answer is yes		
G.30	Is the drainage channel less than 2 m long, broken or dirty?	0	1
G.40	Is there stagnant water close to the well?	0	1
G.50	Is the apron less than 1 m wide all around the well?	0	1
G.60	Are there any cracks in the well apron and headwall?	0	1
G.70	Is the cover of the well unsanitary and closed?	0	1
G.80	Is the well poorly sealed for 3 m below ground level?	0	1
G.90	Is the water point dirty?	0	1
G.100	Is the lift system in a bad condition / are ropes and buckets dirty? If it is a borehole, then no	0	1

2. Roof rainwater harvesting sanitary inspection form		No	Yes
RW.10	Is the roof area dirty?	0	1
RW.20	Are the gutters that collect water dirty?	0	1
RW.30	Is there absence of a filter box at the tank inlet or is it not working well?	0	1
RW.40	Is there any other point of entry to the tank that is not properly covered?	0	1
RW.50	Are there cracks in the wall of the tank?	0	1
RW.60	Is the inside of the tank dirty or not periodically cleaned and disinfected?	0	1
RW.70	Are the taps leaking?	0	1
RW.80	Is the concrete apron near the tank absent or broken or dirty?	0	1
RW.90	Is the drainage in bad condition and the water inadequately drained?	0	1
RW.100	Is there any source of contamination around the tank or water collection area?	0	1

3. Piped supply sanitary inspection form		No	Yes
PS.10	Is the source badly protected, or not protected?	0	1
PS.20	Is there any point of leakage between the source and the reservoir?	0	1
PS.30	If break-pressure tanks, are they covers unsanitary? (If no break-pressure tanks, answer is no)	0	1
PS.40	Is the storage tank cracked or leaking and the inspection	0	1

	cover or the air vent unsanitary?		
PS.50	Is the storage tank dirty or not regularly cleaned?	0	1
PS.60	Are there any leaks in the distribution lines of the system?	0	1
PS.70	Are the areas around the taps unfenced or allowing access to animals?	0	1
PS.80	Is there inadequate drainage and standing water around the taps?	0	1
PS.90	Are the surroundings of the taps dirty and with possible contamination source (excreta, refuse, etc.)?	0	1
PS.100	Is the water not chlorinated?	0	1

4. Surface water : ***ponds***		No	Yes
SW.10	Is there a latrine or any source of pollution within 30 m of the pond?	0	1
SW.20	Does the fence around the well allow animals in? If there is no fence, answer is yes	0	1
SW.30	Is the water point dirty?	0	1
SW.40	Is the lift system in a bad condition / are ropes and buckets dirty? If it is a borehole, then no	0	1

VIII. Observations hygiene/sanitation facilities

Compound / house surroundings Observation		Yes	No
SAN.10	Are human or animal excreta /faeces present in the home / compound / surrounding of the house?	1	0

Individual sanitation Observation		Yes	No
SAN.20	Are the faeces well isolated from the environment? (No leaks, cracks) *	1	0
SAN.30	Is the outlet safe? (Not leading to open sewer, river, sea water…) *	1	0
SAN.40	Presence of any anal cleaning item/material (paper, water…)	1	0
SAN.50	Is there a hand washing station inside the latrine or within 10 paces of the latrine?	1	0
SAN.60	Is there a cleansing agent at this hand washing station inside/near the latrine? Yes includes soap, detergent and ash, whereas no include mud, sand and other	1	0
SAN.70	Presence of flies or other insects entering or exiting the pit	0	1

SAN.80	Presence of excreta on the ground or around the pit or seat	0	1

Water management Observation		**Yes**	**No**
WAT.10	Is the container used to carry water left uncovered during transportation?	1	0
WAT.20	Is the container used to carry water dirty?	1	0
WAT.30	Is the water storage left open/uncovered?	1	0
WAT.40	Is there a water cleaning system visible (filter, boiling container, chlorine tablets…)?	0	1
WAT.50	Ask for a glass/ cup of water to drink. Observe the way water is served: is there a risk of water contamination? (do the fingers touch the water? Or is the scooping container used dirty?)	1	0

ID.120 - Ending time of the interview:

1.4 ANNEXE 4: QUALITATIVE SURVEY GUIDES

DAY 1 – Community leaders and local key informants

Community leaders: Initial meeting

1 - Our names are XX and XX. We are working for Action Contre la Faim (ACF), an organisation that is fighting against hunger ACF is working in Borana zone since 2010.

We are doing a research project to learn more about the causes of undernutrition in communities of Miyo and Moyale woreda.

To learn more about undernutrition we need to conduct several FGD and we would like to invite your community to participate to this study.

I will explain the study and if you want to ask any questions, please ask at any time.

We expect that this study will help to improve the understanding of undernutrition for you, your community, local authorities and other agencies in order to reduce undernutrition in the future. As a community member, you are in a position to provide us with insight into the situation, and we would appreciate it if we could interview several women during several focus group discussions.

To do so, we would like to visit your village for 5 days during the coming weeks. We will organize FGD where we will debate about nutrition, health, care practices, water, hygiene and sanitation, food security and undernutrition.

Each day we will speak about one to two subject, and we will hold several FGD with 6-10 participants to each.

Do you agree to let us do this survey among your village? Do you have any question?

2 – For today, we would like to ask your help to find a community mobilizer. This person will help us to identify the potential participants to the FGD. We are looking for someone from the village. Ideally this person will help us to have a list of households that fit the selection criteria and of person who may wish to participate to the FGD. It can be a health extension worker, a teacher or anyone you think will be happy and able to help us.

3- We would like also to interview some key informants as health extension workers and traditional birth attendant, teachers, traditional healers. Can you help us to meet them today?

4- The participants we would like to participate to the FGD are mothers with children under 5 years old, parents with SAM or cured-SAM children under five years old. We would also like to do some FGD with the fathers of the same children. Ideally we would like to have participants from different wealth group, clan, migrants and non-migrants. If we can welcome mother from different financial background (very poor, poor, not poor) and different background (migrants, non migrants), it could be very helpful for our study.

It will be very good if we can have also some mothers with positive deviant children (well-nourished, healthy but from the same community).

Can you help us? Thank you!

Health Extension Workers interview guideline (themes: health, malnutrition, IYCF)

1. Can you tell me about the situation of X village?

2. How far is the village from the Health Center? the Health Post?

3. What is the main religion of the village?

4. What are the main health problems in the village?

5. What are the main diseases affecting children? What are the causes? Who get more sick : boys or girls? Why?

6. When are illnesses highest in this village?

7. How is the nutritional status of children in this village?

8. Last year were there any malnourished children from the village? Probe : ask for information on their situation *=> identify mothers of malnourished children for individual interview*

9. Are there poor mothers in the village who have healthy well-nourished children? Why do think this is? *=> identify Positive Deviant parents for individual interview*

10. Do you consider malnutrition to be a problem in this village? Probe : compared to other villages?

11. Are there any types of households that are more vulnerable to undernutrition?

12. When are children identified as being undernourished? Probe : wasted and stunted

13. What do you do if a child from the village is undernourished? What advice do you give to the mother?

14. According to you what are the main causes of undernutrition in the village?

15. What are the main constraints parents faces in keeping their children healthy?

16. When is undernutrition highest in this village?

17. Are the any cultural traditions in this village which may affect child nutrition?

18. Do people use to wash their hands? If no, why? With soap? If no, why?

19. Do people have latrines? Do they use them? If no, why?

20. How is the situation of women in this village (Workload? Support? Status? Etc.)

21. What is the main diet in the community? Does this change over the seasons?

22. Are some food items avoided for pregnant women? For lactating women? For children?

23. What kind of health and nutrition education do you provide in the village? How often? What challenges do you face? What improvements have you seen?

24. Where do most women give birth? How are Ante-Natal Care and Post-Natal Care coverage? Probe : *any data on Low birth weight?*

25. How are breastfeeding practices? How are complementary feeding practices?

26. Is there any believe regarding breastfeeding?

27. How do parents respond if there are told their child is under-nourished? What are the local solutions?

Village leaders, teachers, NGOs Interview guideline (themes: malnutrition, food security, wash,

1. What are the tribes/clans existing in the village? What differentiate them (*in term of assets, believes, etc…)?* Are men polygamist in this village?

2. What do “malnutrition” or “”undernutrition means for you?

3. How do you recognize a child suffering of undernutrition? How would you describe this child? (probe : different form of undernutrition?)

4. What can be the causes of undernutrition? Do you think that some behaviour or practices can cause undernutrition?

5. Is malnutrition a disease? If yes, it is contagious?

6. Are all the children you know growing equality? If no, why do they not grow in the same way?

7. Do you think some children can be more likely affected of undernutrition than others? Who are they? And why?

8. Can adults be affected by malnutrition? Who can? Is there any link with their age? If yes, what age is at risk?

9. Is malnutrition a big problem in you village?

10. What do you do if you see a malnourished child? And how can you avoid that?

11. How do the households manage to have healthy children?

12. What are the livelihoods in your village?

13. What are the main challenges for these livelihoods?

14. Which type of animals is herded in this village?

15. Do each household of this village have livestock? Why?

16. Which animals migrate/move in search of pasture? At which period of the year?

17. Do all the household members move with animals? Who is moving? When?

18. Where do they go?

19. Are there any crops grown in the village? Which ones? What for?

20. How people get their food?

21. Are there certain months in year when HH do not have enough animal milk to give to the children? Which months and why?

22. Are there certain months in a year when HH do not have enough food? Which months and why?

How do HH cope during the hunger season? Probe : which HH are able to cope better than others?

23. Do you know who prepares the food at home? Who is choosing the food to buy and go to buy it?

24. Do all the family eat together or there is any kind of order? If yes, who eat first? Second? Third?

25. Do you think the family give more food to boys/girls/both or same?

26. What kind of food the children are eating? Is there any special items given only to the children?

27. What are the main sources of drinking water?

28. Does water access change according to the seasons?

29. Do people use to wash their hands? If no, why? With soap? If no, why?

30. Do people have latrines? Do they use them? If no, why?

1.5 TRADITIONAL BIRTH ATTENDANT INTERVIEW GUIDELINE (THEMES: CARE PRACTICES, MENTAL HEALTH, FOOD HABITS)

1. Who is mainly taking care of the children? Of the babies? Do the fathers take care of their children?

2. Do somebody give advices the parents regarding their child (*diet, health, school…).* If yes, who?

3. What is the role of grandparents regarding the grandchildren?

4. At which age the women/men use to get married?

5. At which age the mothers use to have their first child?

6. How many children per household? Is it better to have a lot of children or only few? Why?

7. Is it the same to have a baby boy or a baby girl? If no why?

8. What is the role of the mother in law regarding the new baby?

9. Do you think mothers are working too much?

10. Where do most of the mothers deliver? Why? Do they come back to work soon after delivery? Why?

11. How is the situation of women in this village (*Workload? Support? Status? Etc*.)

12. How will you describe family relationship in this community? Do women have the same access to resources than men (money, water, food, education, health …)? Do they have the same rights?

13. Who is mainly taking the decision within the HH? Are women able to take decision for themselves by their own?

14. When a baby born, what does she/he eat first? And during the first 6 months ? And after ?

15. Do the mothers breastfeed their children? Do some mothers don't breastfeed their child? Why?

16. Is breastfeeding a good thing?

17. When a baby is born, does the mother stay with his husband or does she come back to her family?

18. Is there any believing regarding breastfeeding?

19. What is the main diet in the community? Does this change over the seasons?

20. Are some food items avoided for pregnant women? For lactating women? For boys? For girls?

21.Are there any special items given only to the children? Given only to the pregnant women? To the lactating women?

22. Is all the year the children eating the same food?

23. If a child is sick, what the family do first? Where do they go?

24. Who takes care of the sick child? What the family do if the sick child doesn't get better?

25. How do we recognize a healthy child?

26. Are some children sick because of bad spirit? If yes, what do you do?

27. Are some traditional treatments available in the village? What kind? Who give advice to use this kind of treatment?

DAY 2 – FGD Good nutrition - Malnutrition

Participants: 6-10 mothers of children U5

Objectives:

- To Develop a local definition and understanding of undernutrition

- Explore respondent perception of the causes and consequences of undernutrition

- Identify seasonal and historical trends in undernutrition

Additional RF to explore :

- level of knowledge of nutrition basics

- intra-household food allocation

No of FGD: at least 2 (=> wealth group / grandmothers / mothers of children U2 ?)

Questions on Undernutrition

1. For you what is a healthy child?

What is a nice body for a baby / child ? How do you know when a baby / child is not well?

What are the signs (physical, behavioral, psychological) that a baby / child is not growing normally?

What do babies need to grow well? What do children need to grow well?

Do you know what is a healthy weight for new born babies?

Are all the children you know growing equality? If no, what do you think? Why do they not grow in the same way?

2. Did you ever heard about “malnutrition” or “”undernutrition”?

What does it means for you? (*identify specific terms or expressions used*)

How do you recognize that a baby / child is undernourished?

How would you describe a malnourished child?

Is there more than one type of malnutrition? (If yes, what are they?)

3. Compare to other health issues, do you consider undernutrition as a big problem in the village?

4. Do you think an adult can suffer from undernutrition? Which age is at risk?

What happen if a pregnant or lactating woman is suffering from undernutrition?

5. Do you think some children can be more likely affected of undernutrition than others? Who are they? And why?

What do you do to prevent an infant from becoming malnourished?

What do you do when an infant becomes malnourished?

6. Are there times in the year when there are more children who are not growing well or too thin? Why?

7. Compared to previous years, are there more, less or the same number of children who are too thin or not growing well? Why?

8. What challenges do mothers in your community face to keep their children healthy and growing well? Do you face these challenges throughout the year? How do these challenges change with the season?

9. What can be the causes of undernutrition? Do you think that some behaviour, practices or cultural tradition can cause undernutrition?

Questions on perception of good nutrition

10. What do you think is good nutrition?

11. What kinds of food adults should eat to be healthy/not get sick? Why?

Are adults in your village able to eat this food? Men/women?

Are there any foods which are bad/avoided for men / pregnant / lactating women to eat? Why?

12. Should pregnant women eat more/less during pregnancy? Why?

Do pregnant women in your village eat more or less during pregnancy? Why?

13. What kinds of food children should eat to be healthy/not get sick? Why?

Do children in your village eat such food? Why/why not?

Do they eat such foods even in the hunger season?

Are some kinds of food avoided/bad for boys? For girls? Why?

14. Do you know what food groups are? Can you name some of the food groups and what they do?

15. Do you know what types of food contain vitamin A? Do you know what they do?

16. Are mothers able to feed vitamin A food to children? Why/why not? Throughout the year?

17. Do you know what types of food contain iron/protein? Do you know what these foods do?

18. What is a typical food for you?

How many meals do children / men / women have a day? What do they have for each meal?

Do young children eat family food or something different? Why?

How many time per day do you cook? How long it takes? How is the food stored?

Do all the family eat together or there is any kind of order? If yes, who eat first? Second? Third?

Do you think the family give more food to boys/girls/both or same?

Is there any special items given only to the children? To the men? To the women?

DAY 2 – Food Security and Livelihood + fathers 'perception

Participants: parents of children U5

Objectives:

- To characterize FSL

- Explore men's perception of the causes and consequences of poor FS/ wash/health/care in relation to undernutrition

- Explore how FSL change over seasons and over time

Additional RF to explore :

- access to pasture

- women workload

No of FGD: 1 (men)

1. What are the main livelihoods in this village?

2. What are the main constraints / challenges / hazards for these livelihoods?

3. Have livelihood changed over the recent years? How? (historical trends)

4. What are the different types of land tenure in your village? (=> how do you access land?)

5. Are grazing lands easily accessible?

Which type of animals is herded in this village? For what purpose?

Do each household of this village have livestock? Why?

At what period of the year do you sale livestock (*seasonal calendar*)

Do you vaccinate animals?

What are the main diseases seen in your animals? Do some animal die from disease? At what time of the year is it happening more? (*seasonal calendar*)

Which animals migrate/move in search of pasture? At which period of the year? (*seasonal calendar*)

Do all the household members move with animals? Who is moving? When?

Where do they go?

Regarding livestock, which tasks are men's work and which tasks are women's work?

5. Are farming lands easily accessible?

Are there any crops grown in the village? Which crops? What for?

Regarding farming, which tasks are men's work and which tasks are women's work?

Are there months in the year when you grow less food than others? When? How do you cope during this time?

6. How do people usually get their food? What are the main sources of food?

What proportion of food is grown and what proportion bought? Which things are grown, which things are bought?

Do you think most households are able to access enough food and/or enough 'good' food to keep their families healthy? Why/why not?

Are there certain months in year when HH do not have enough animal milk to give to the children? Which months and why? (*seasonal calendar* : animal lactation period)

Are there certain months in a year when HH do not have enough food? Which months and why?

How do HH cope during the hunger season? Probe : which HH are able to cope better than

7. What are the main issues/constraints to food security in this village?

Compared to previous years, do you think the food security situation is the same, better or worse? Why?

8. What do most people in your community do to earn money? What are main sources of income? (for each season)

Do men/women ever work away from home? When? What do they do?

10. Where is the nearest market to this village? Are markets functioning well year round? Do you think you have access to good food?

Have food prices changed over the year? At which times of year are things more expensive? Why? (*seasonal calendar*)

How do you cope at this time?

Malnutrition: What do you understand by malnutrition?

Is malnutrition a big problem in your community?

Do you think an adult can suffer from malnutrition?

WASH: Where do you go for toilet? What do you do after?

Health: Where do you or your family members go when sick?

CP: Do you take care of your child? What kind of care (feeding, bathing)? What do you do before feeding and after feeding them?

MH: How would you describe the workload of women/men (at home/on the field)? Do you think you have too much work to do? And your wife?

Who is taking the majority of the decision? How do you feel regarding that? How does your wife feel regarding that?

Historical trends

In the past years, what was the main development in your village? (Probe ; new road, electricity, tap water)

In the past years what was the period where you got more difficulty to work? Why?

In the past years, do you remember if there were period when people get more sick than usual? When?

In the past years did you notice a period when it was more difficult for your community to access food? When and what was the reason ?

Was there a time when prices at the market increased to a level that you could not afford? When?

What was the main disaster/hazard (*probe : war, drought, floods, disease outbreak…)* that affected your life? How did it affect your life?

DAY 3 – FGD Health

Participants: 6-10 mothers of children U5

Objectives:

- To characterize child health

- Explore respondent perception of the causes and consequences of poor child health in relation to undernutrition

- Identify seasonal and historical trends in child health

No of FGD: 2 (wealth group)

1. What are the most widespread illnesses in the village?

2. Do the children have different illnesses from adults? What are they?

3. (For each illness) Could you tell more about signs and symptoms of this illness? Are there others words to refer to this illness?

4. What do you think are the causes of these illnesses (one by one)?

5. When children get these diseases? (*Seasonal calendar*)

6 Are some children in the village more often sick than others? Why?

7. What do you do if your child is sick? Who do you consult first? Second?

8. Who do you trust to give you advice on your child health?

9. What do you do if your children get worst?

10. Do you use self-medication? What kind? For what purpose/illness?

11. What do you do if your child has diarrhea?

12. Do you feed him/her more? Do you avoid any food?

13. Do you continue to breastfeed him/her? Why / why not?

14. (Grandmothers only). In the past years did you notice any change regarding child treatment? What kind? How does it change?

15. What are the main challenges to keeping your children healthy and why?

DAY 3 – FGD Wash

Participants: 6-10 mothers of children U5

Objectives:

- to characterize water, hygiene and sanitation

- Explore respondent perception of the causes and consequences of poor WASH in relation to undernutrition

- Explore how WASH change over seasons and over time

Additional RF to explore :

- exposure to unhealthy environment

- hygiene practices

- Access to water

No of FGD: 1

1. What are the different sources of water you use?

2. (*Seasonal calendar)* : What are the months/seasons you have enough / less water?

3. Are you using the same source of water for human and for animals?

4. How long per day do you need to collect water? (go / queue/take/back)

Is it all the year the same?

When do you use to collect water?

How much water do you collect per day?

5. How do you know if a source of water is safe or not? Is there something you can do to make water safe to drink?

How is the quality of the water in the village? Do you drink directly the water? Why?

6. What happen if you drink not good / unsafe water?

7. Does everyone is able to drink as much water as he wants/needs?

8. How do you collect the water (which container)? How often do you wash it?

How do you keep/store the water? How often do you wash it?

9. For what purpose do you use water? Do you have enough water for these needs?

10. Are there times in the year where you don't have enough water for your needs? (*seasonal calendar*)

11. How often do you wash your children? Do you know what germs are? What do you think they do?

12. How can you prepare food hygienically? Are you able to do this?

13. Where do you go for toilet (*probe; for defecation? For urinate*?). Does anyone go outside?

Do you bring water with you? What for?

14. Has each family in the village a toilet? Do you think toilets are clean? Who is responsible for cleaning the toilets? How often are they cleaned?

15. Do children use latrines? Where do they go?

16. Do HH own and use soap? Why/ why not?

17. Do you think it is important to wash hand? Why / why not? When ?How?

18. What might happen if you don't wash hands after going to the toilets and then prepare food?

19. What would you define as good hygiene practice for a child? And bad practices?

Are good hygiene practices usually implemented? Why? What are the constraints?

DAY 4 – FGD Care Practices

Participants: 6-10 mothers of children U5

Objectives:

- To characterize care practices

- Explore respondent perception of the causes and consequences of poor care practices in relation to undernutrition

- Identify seasonal and historical trends in care practices

No of FGD: 2 (mothers children U5 / grandmothers)

1. Who is generally taking care of the young children? Of the babies? Do the fathers take care of their children?

2. What do you think is good child care? Good baby care?

3. How can mother keep children/babies healthy and happy?

4. Are mother in the village able to look after their children well? Why / why not? Do mothers receive support for looking after their child? By who?

5. Are the time in the year when it is harder to care for your children than other? When? Why?

6. Do you think there are ages when a child needs particular care and attention? Why?

7. When your baby just born, how did you feed him/her? What was his/her first food? When? Why?

8. Do most women feed babies with colostrum? Why / why not?

9. Did you had any problem to breastfeed you child? What solution did you find?

10. For how long most of the mothers breastfeed their child? What are the main constraints to breastfeed children?

11. Do babies need anything else other than breastmilk? What? Why?

12. Up to 6 months what your baby ate? Did you give him/her water? Animal millk?

13. When did you start feeding babies with semi-solid or solid food in addition to breastmilk? What was it?

14. How did you know it was the good moment to change your baby diet? Who gave you advice?

15. How many times a day young children (6 – 24 months) need food? Why? What about other children?

16. What quantity of food do you give to your child?

Do you give the same quantity to boys and girls? Are there different quantities at different ages? At what age do you star feeding your children with family food?

17. Who feed the children? Do older siblings are feeding the child? What age are they?

18. If children do not want to eat, what do you do?

19. If children are naughty, disobedient, what do you do?

20. How much time do you spend with your children per day? Is it same all year round? What are the constraints regarding the time spent with children?

21. How would you describe a mother that is taking good care of her child?

DAY 4 – FGD Mental Health

Participants: 6-10 women

Objectives:

- To characterize maternal mental health

- Explore respondent perception of the causes and consequences of poor maternal mental health in relation to undernutrition

Additional hyp to explore :

- decision power

- women workload

- maternal well-being

No of FGD: 2 (mothers of children U5 / grandmothers)

FGD WITH MOTHERS WITH CHILDREN U5:

1. During pregnancy :

- do women eat same food as usual? Do they take any medicine? What kind?

- do women get a prenatal care/check? With whom? How often? How did she/help you?

2. How do you know a pregnant woman is not well? How do you know if she is malnourished? How will be the baby if the mother is malnourished during pregnancy?

3. Where do most of women give birth? Why?

4. Do pregnancies / deliveries occur at certain time of the year?

5. How are the services at the health post/ health center? What are the main constraints from accessing care at these facilities?

6. Do women get medical check after delivery and during the first months after delivery? By whom? How often?

7. Is circumcision practiced in this village? Why? Who is concern? At what age is it done? By whom? Is it a time of the year for the circumcision?

Does circumcision have any impact on one's life (probe : impact on women health / well-being) ? What kind?

8. According to you what is the best age to get married for men and women?

At what age women used to get married in this village?

9. According to you what is the best age to get a first baby? (probe : what age is considered too young) At what age women use to have their first child? Do you think mother in the village had their 1st child too young?

What do you think are the consequences if women have children too young?

10. What do you think is the ideal family size? How many children do most families have in the village? (*If different from ideal size, why?)*

11. Who decides when to have another child? If you don't want another child what do you do?

12. What is the ideal space between births? Are families able to space the births in this way? How? (*probe if use of family planning*) . what is the average time between pregnancies?

13. How do you keep women healthy after delivery?

14. After delivery what women do to keep their baby healthy?

16. How would you describe the workload of women?

17. Do you feel you have support? From whom?

18. How are responsibilities shared within the household? Do lactating / pregnant women have different responsibilities?

19. Who takes the decision regarding : the expenditure of the HH's money? The schooling of children? Medical consultation for children?

FGD WITH GRANDMOTHERS :

1. Who is generally taking care of the young children? Of the babies? Do the fathers take care of their children.

2. Did you give advice to your daughter-in-law regarding her baby diet? What kind?

How do you know when is the good moment to change the diet of the baby? Is there any food which should not be given to young children? Why?

3. Did you any change regarding the care practices and the breastfeeding practices in the past years? What kind of change? Why did that change?

4. How would you describe the workload of women? At home? In the field?

5. Do you think your daughter-in-law has too much work to do? If she needs to stop working for a while, is it possible? If no, why? Who takes the decision? (you/someone else)

6. If your daughter-in-law is feeling too tired or a bit depressed, what do you do?

Do you think your daughter in law is spending enough time with her child? If not, what are the reasons and the consequences?

7. In the past years, did you notice any significant change on the access to education?

8. When your daughter-in-law got pregnant, did you give her any advice? What type?

9. What resources do women have independent access to (*any properties? Assets?)*

10. How are the responsibilities shared within the HH? Who is taking the decisions? (*Probe : for income, education, health*). What do you think about it?

11. In the past years did you notice any change regarding decision making?

Historical trends

In the past years, what was the main development in your village? (Probe ; new road, electricity, tap water)

In the past years what was the period where you got more difficulty to work? Why?

In the past years, do you remember if there were period when people get more sick than usual? When?

In the past years did you notice a period when it was more difficult for your community to access food? When and what was the reason ?

Was there a time when prices at the market increased to a level that you could not afford? When?

What was the main disaster/hazard that affected your life? How did it affect your life?

DAY 5 – Life story of positive and negative deviant child

Participants: 2 mothers of healthy children ; 2 mothers of malnourished children

Criteria for positive deviant mothers: very poor and having healthy chid 6-24 months old

Objectives:

- To understand constraints of mothers with malnourished children

- To identify bad practices of mothers with malnourished children

- To understand how mothers of malnourished children perceive the health status of their children.

- To identify positive deviant behavior

- To understand the practices of positive deviant mothers

1. What is your name? how old are you? How old were you when you get married? How old were you when you had your first baby? How many children do you have? How old are they (*specify the sex for each*)?

2. Did you plan to be pregnant of (*name of last child / undernourished child*)?

When you discovered you were pregnant of (name), how did you feel (happy, sad, no special feeling)?

3. Did you consult a doctor, a midwife or a traditional birth attendant during your pregnancy? What kind of advices did you get from them? How many times did you see them? Did you get advices from someone else? What kind of advices?

4. Did you take any specific medicine during your pregnancy? Did you change your food intake?

5. Till when did you work before delivery? How did you feel regarding your pregnancy?

6. Where (name) was born? Who help you for the delivery? Why did you choose to deliver at this place?

Did (name) see a doctor when she/he born?

7. What was the first food she/he take and when? If no BF, why? Till when?

8. How do you know if your child is sick? From what kind of sickness you child can suffer? What do you do when (name) get sick?

9. Do you have any difficulties to go to the health center? Usually how do you overcome these bariers / challenges?

10. a lot of children can suffer from diarrhoea. Do you know what it is? Is it happening often to your child? Do you know why? What do you do when your child suffer from diarrhoea.

11. After (name) born, when did you go back to work?

At this time, who took care of (name)? How did you manage to feed (name) at this time?

12. What is your daily schedule? Who is taking care of (name)? How do you manage to feed her/him?

13. Do you feel sometime, too much tired to take care of (name)? How do you manage at this time?

14. What are the main issues you are facing to raise (name)? How are you facing to these issues?

15. What kind of food do you give to your child? Are you cooking specially for her/him? How do you feed him/her?

16. What do you do if she/he refuses to eat? How do you know what kind of food is good for him and her? Can you explain me when you change the diet of your child? For what kind of food?

17. Are you able to take decision by yourself regarding the health and education of your child? What are the issues you are facing regarding that? How do you manage?

18. If the child is the last born: Do you want more children after (name)?

If no, do you do something to avoid a new pregnancy? Did you take this decision by yourself?

If yes, do you want another child now or later? If later, how do you manage to space pregnancies? Did you take this decision by yourself? Who give you advice on temporary contraception/sterilization?

19. Between (name) and his elder sibling, did you do anything to space pregnancies?

20. If the child has younger sibling: did you do something special to space both pregnancies? Who gave you advice to do that? Did you take this decision by yourself?

21. Some women told us their husband was violent with them, it is happening to you? How do you feel? What do you do then? Do you know why it is happening?

22. Is there anything that help your children to stay healthy? Do you think there is something specific that impact the health of your baby?

DAY 5 – Rating Exercise

Participants: 1 group mothers/grandmothers of children under 5 + 1 group of fathers/grandfathers of children U5

Objectives:

- To propose a definition of under nutrition

- To rank the hypotheses related to under nutrition raised during FGD

Propose a definition of undernutrition designed accordingly to the communities' thoughts:

1 - Do you agree with this definition? *(Debate if not, to design a closer definition to their thoughts).*

2 - Present the most relevant hypothesis related to undernutrition raised during the FGD by using the drawing/picture of each hypothesis.

Ask the participants if they agree with all the hypotheses or if they have to amended or rejected some of them.

Once they agreed, distribute the drawing to the participants. Ask them to split in small groups (if high number of participants).

Ask the participant to rate them from 1 (for most important contribution to undernutrition) to 5 (for less important contribution to undernutrition). Ask for the rate. Debate.

1.6 ANNEXE 5 : LIST OF PARTICIPANTS OF THE INITIAL TECHNICAL EXPERT WORKSHOP

Organisation	Participant name	Position
Mercy Corps	Gemeda Daba	Nutrition and SBCC field level technical advisor
Bule Hora Universty	Jarso Doyo	Lecturer (geographer)
Bule Hora Universty	Bayisa Badu	Departement Head (socio-anthropologist)
Bule Hora Universty	Abebe Gemad	Lecturer (animal science)
Oromiya Region Disaster Prevention and Prepardness Commission	Yoseph Kanaa	Nutrition Officer and RENCU coordinator
Ethiopian red cross	Galgado sora	Finance officer Yabello Branch
Zone Pastoral Dev Office	Mohamed Aklader	Early warning officer
Zone Disaster Preparedness Prevention Office	Liban Kabade	Early warning officer
Zone women and children affaires	Mengistu Eticha	Women and children focal point
Zone health Office	Teklmedine Kefen,	Maternal & Child Health Care coordinators
Zone health Office	Wario Jilo	Nutrition officer
Zone Cooperative Promotion Office	Galma Wako	Communicator
Pastoral Development Office Moyale woreda	Galgalo Wako,	Early warning officer
Pastoral Development Office Miyo woreda	Basazen Abraham	Nutrition focal point
Women and children affairs office Moyale woreda	Barako Sora,	Women and children focal point
Women and children affairs office Miyo Woreda	Hirbo Wako	Gender expert
Disaster Prevention Preparedness Office Moyale	Mohamed Godana	DRM focal point
Water office Miyo	Daniel Chaeka	Water supply focal point
Water office Moyale	Wedemu Gube	Water supply focal point
Health office Miyo woreda	Garbole Sora,	Nutrition focal point

Health office Miyo woreda	Lemma Amare	Maternal & Child Health Care coordinators
Health office Miyo woreda	Haro Rachay	WASH expert
Disaster Prevention Preparedness Office Miyo woreda	Yacob Bachare	DRM focal point
ACF	Amina Kanpise	Nutrition and Health Programe Manager
ACF	Meki	WASH Programe Manager

1.7 ANNEXE 6 : RESULTS OF RISK FACTOR SURVEY

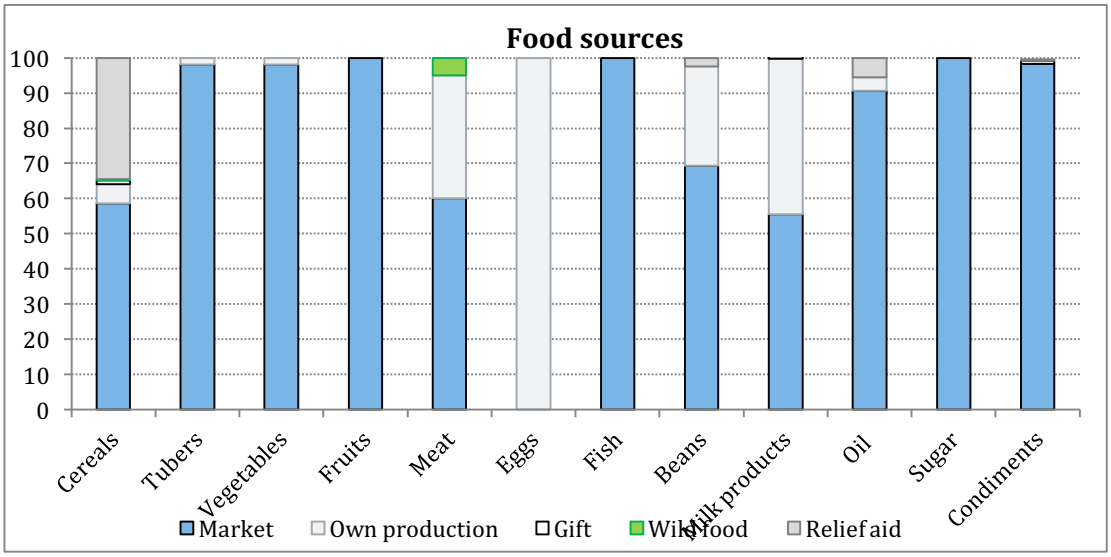
Indicators	Sample	Mean or proportion	Lower CI 95%	Upper CI 95%
Head of household	705			
man < 18 years		0.14	-0.14	0.42
man > 18 years		87.66	85.23	90.09
woman < 18 years		0.57	0.01	1.12
woman > 18 years		11.63	9.26	14.00
Household size	705	6.03	5.87	6.19
Main caregiver	705			
mother		95.89	94.42	97.36
father		2.55	1.39	3.72
grand-mother		1.56	0.64	2.48
Age caregiver	705	29.30	28.68	29.91
Age 1st delivery	705	18.14	17.99	18.291
Marital status	705			
Married		91.63	89.58	93.68
Separated		3.55	2.18	4.92
Single		0.14	-0.14	0.42
Widow		4.68	3.12	6.24
FOOD SECURITY AND LIVELIHOODS				
HDDS	705	3.71	3.38	4.04
Household food sources	705	cf. charts		
MAHFP	705	8.67	8.44	8.91
Intra-HH food allocation	705	cf. charts		
Ownership	705			
Livestock		82.98	77.25	88.71
Land		56.60	49.31	63.88
Average land size	399	2.66	2.36	2.97
crops cultivated		cf. charts		

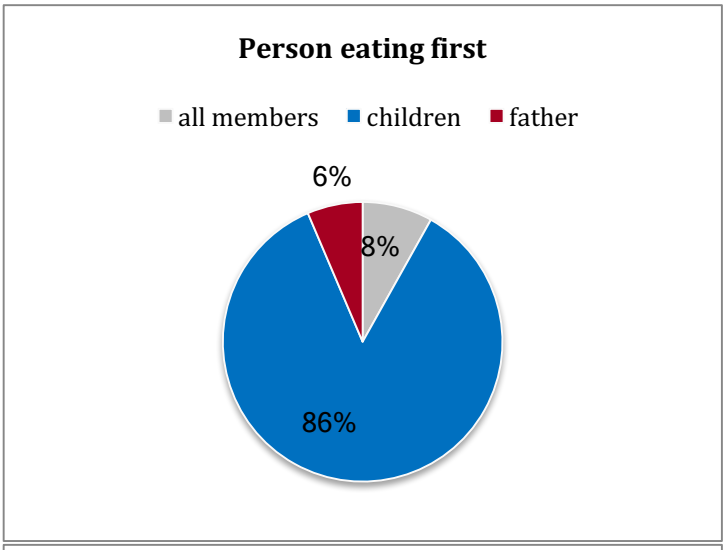
Herd composition	585	cf. charts		
WASH				
Main source of water rainy season	705			
groundwater		33.05	23.213	42.886
roof water		3.404	0.324	6.484
pipped supply		31.064	22.783	39.345
surface water		32.482	20.396	44.568
Distance to water source rainy season	705			
< 30 minutes		67.38	56.23	78.53
31 to 60 minutes		22.98	14.56	31.40
2 to 3 hours		7.66	2.16	13.16
> 3 hours		1.84	-0.73	4.42
Don't know		0.14	-0.14	0.43
Main source of water dry season	705			
groundwater		48.94	39.48	58.39
roof water		0.57	0.04	1.10
pipped supply		36.88	28.36	45.40
surface water		13.48	4.10	22.85
Distance to water source dry season	705			
< 30 minutes		50.07	38.65	61.50
31 to 60 minutes		26.10	17.89	34.31
2 to 3 hours		14.47	5.26	23.68
> 3 hours		9.36	2.24	16.48
Water contamination risk _Rainy season	705			
no risk		29.08	18.31	39.85
mild risk		30.36	20.48	40.23
moderate risk		8.65	2.54	14.77
severe risk		31.92	19.58	44.25
Water contamination risk _Dry season	705			
no risk		44.82	5.66	33.21
mild risk		30.36	4.81	20.48

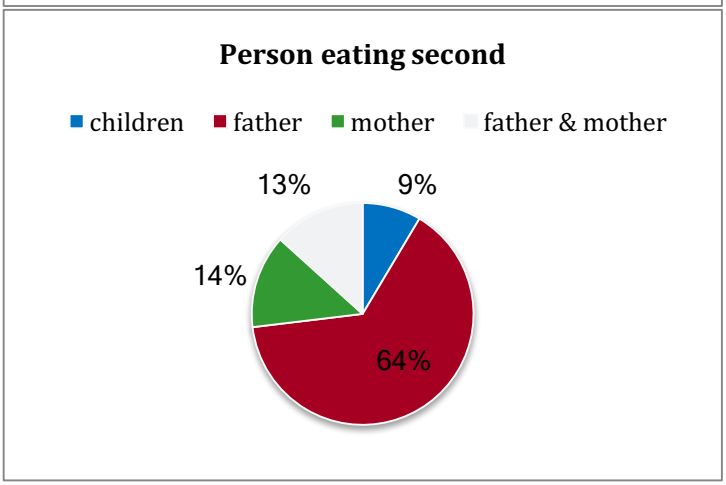
moderate risk		8.65	2.98	2.54
severe risk		16.17	5.08	5.74
Water management score	705			
no risk		1.56	0.24	2.88
mild risk		53.76	42.97	64.55
moderate risk		31.35	23.78	38.91
severe risk		13.33	6.74	19.93
Latrine	705			
Use of latrine		78.30	69.41	87.19
Use of safe latrines		8.09	3.89	12.28
Safe disposal of child's feces	338	51.18	2.72	45.83
Hygiene	705			
Mother with appropriate hand-washing practices (score >7)		62.84	53.99	71.68
Presence of soap in the household		84.07	79.42	88.71
CHILD HEALTH				
ARI in the past 14 days	919	14.26	10.79	17.72
Diarrhea in thepast 14 days	919	10.34	7.25	13.43
ACCESS TO HEALTH SERVICES				
ANC				
caregivers who saw a health professional	705	86.53	82.82	90.23
At least 4 times	610	54.61	48.79	60.43
Main barrier to the health center	705	cf. charts		
NUTRITION				
Mother's nutritional status	688			
normal (MUAC ≥ 22 cm)		89.10	1.19	86.76
undernutrition (MUAC <22 cm)		10.32	1.16	8.04
severe wasting (MUAC < 19 cm)		0.15	0.15	-0.14
extreme wasting (MUAC < 16 cm)		0.44	0.25	-0.06
Children's nutritional status	701			
Global Acute Malnutrition		10.8	8.3	14
Severe Acute Malnutrition		0.9	0.3	2.1

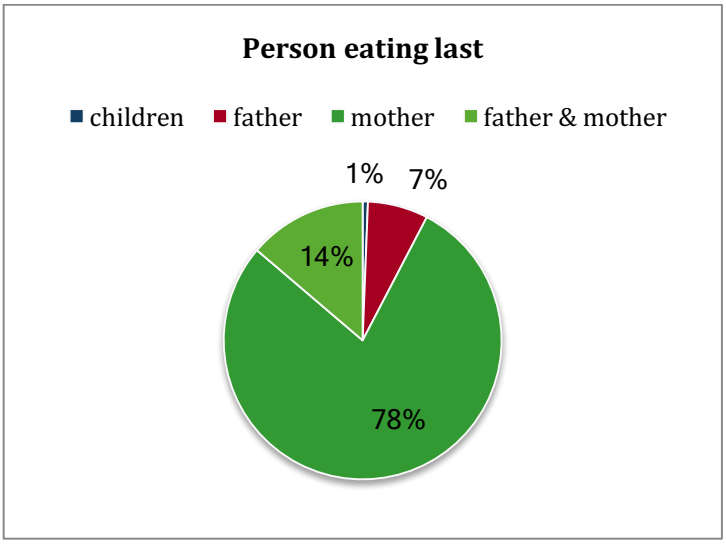
Stunting		21.7	17.6	26.4
Underweight		27.3	22.2	33.2
Severely underweight		4.9	3.3	7.2
IYCF				
Child 0-24 months ever breastfeed	338	94.68	92.49	96.86
Early initiation of BF	338	86.69	78.02	95.35
Exclusive breastfeeding	61	55.74	40.73	70.75
Continued breastfeeding at 1 year	62	100.00	100.00	100.00
Continued breastfeeding at 2 years	60	85	75.698	94.302
Complementary feeding (6-8 months)	47	25.53	11.81	39.26
IDDS (≥ 4 groups)	270	0.37	-0.383	1.124
Meal frequency (6-23 months)	276			
adequate		15.22	8.98	21.45
inadequate		84.78	78.55	91.02
Responsive feeding (child 24-36 months)	280	cf. charts		
Children psychological care (children > 23 months)				
Mean caregiver-child interaction score (-4 to 7)	581	5.08	4.80	5.35
Proportion of appropriate caregiver-child interactions (score >4)	581	80.90	75.17	86.62
Care for women				
Mother food intake during pregnancy	700			
more than usual		22.11	15.30	28.92
less than usual		54.78	47.50	62.06
same than usual		23.11	18.18	28.04
Caregiver's level of education	705	cf. chart		
Perceived social capital	701	cf. chart		
Mothers who feel they have too much work to take care of their child	705	72.91	67.32	78.49
Mothers at risk of depression (WHO5 <13)	705	52.6	44.6	60.7
Perceived low birth weight	919	22.20	19.08	25.32
Undesired pregnancy	705	83.55	78.39	88.71
Early child bearing (<18 years)	704	43.75	38.42	49.08

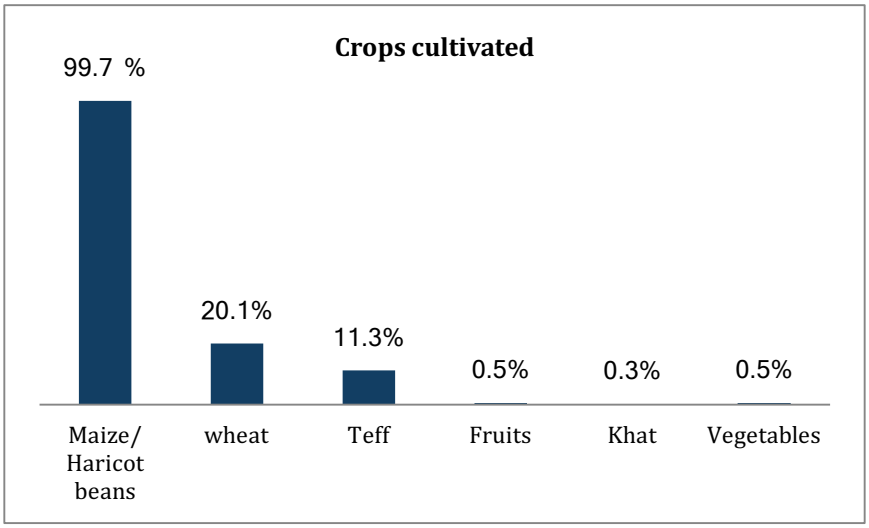
Short birth spacing (children < 24 months with younger sibling)	338	1.48	-0.03	2.99
Current use of family planning	688			
traditional FP		91.13	88.33	93.94
modern FP		8.87	6.07	11.67
Modern contraceptive means	61			
injectable		75.41	62.22	88.60
implants		16.39	4.79	28.00
pills		8.20	-0.48	16.87
Average rest after birth (in days)	705	48.86	48.66	49.06
Women taking rest (> 40 days) after delivery	705	99.72	98.68	100.76
Women with no decision power	705	13.33	9.69	16.98
Women who take decisions alone or with their husband	705			
Child education		67.38	62.52	72.23
Child health		80.28	75.44	85.13
Money expenses		68.79	63.32	74.27
When to have another child		80.71	76.49	84.93

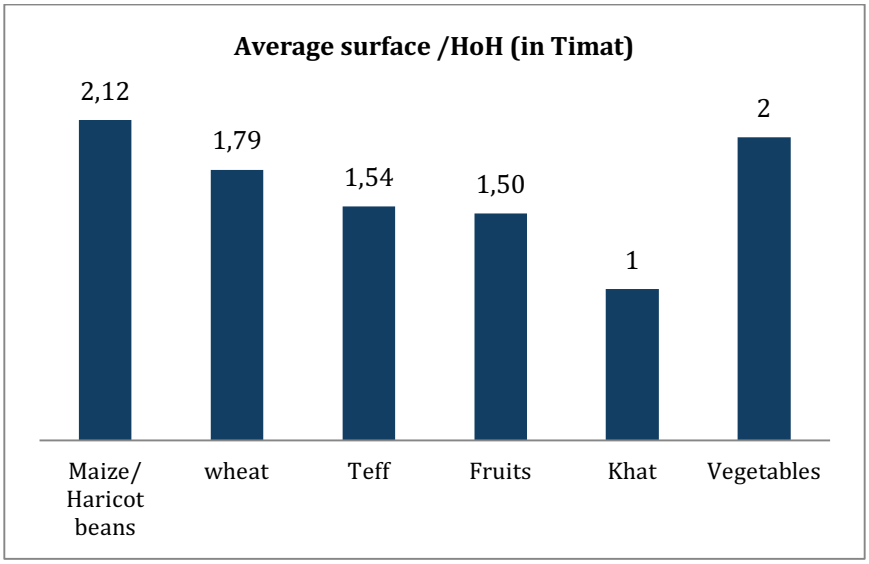


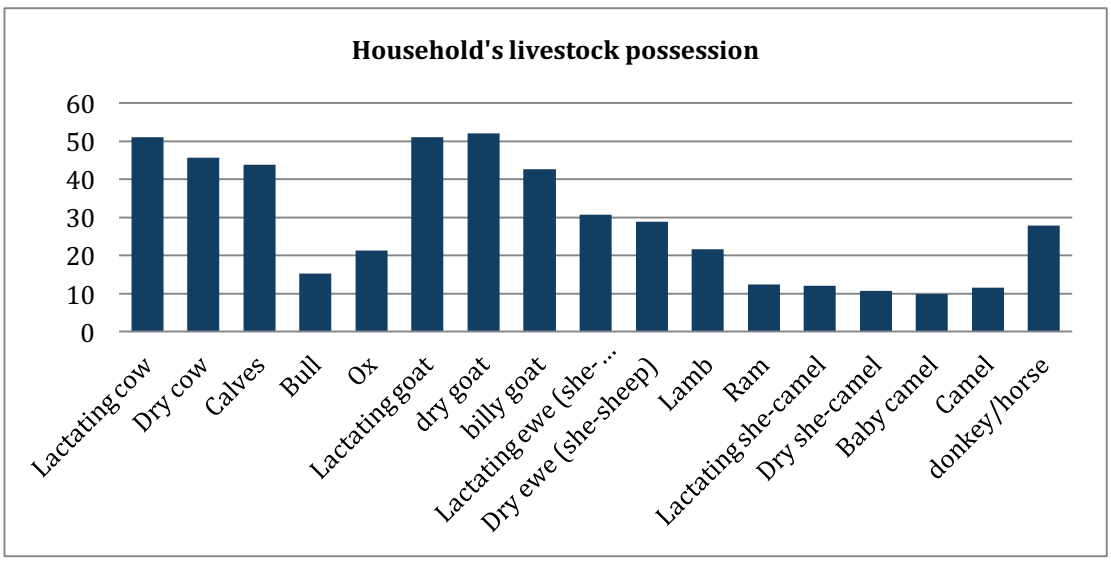

Person eating first
all members
children
father
6%
8%
86%

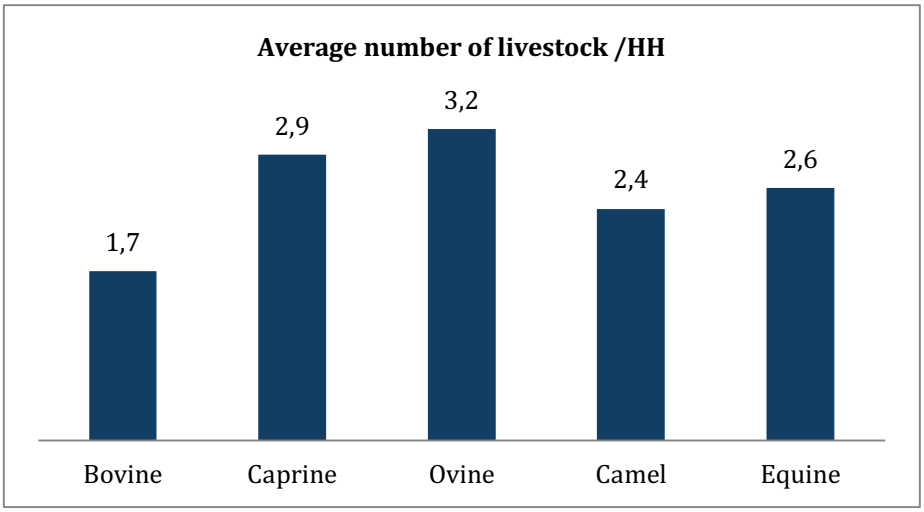

Person eating second
children
father
mother
father & mother
13%
9%
14%
64%

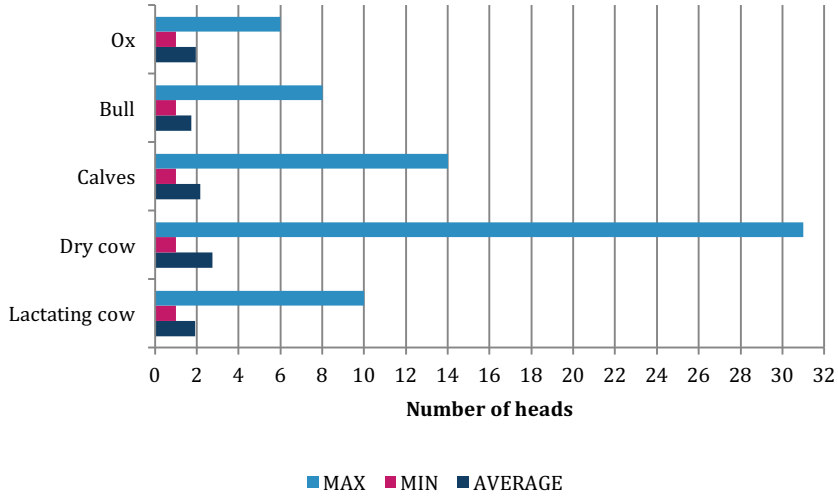

Person eating last
children
father
mother
father & mother
1%
7%
14%
78%

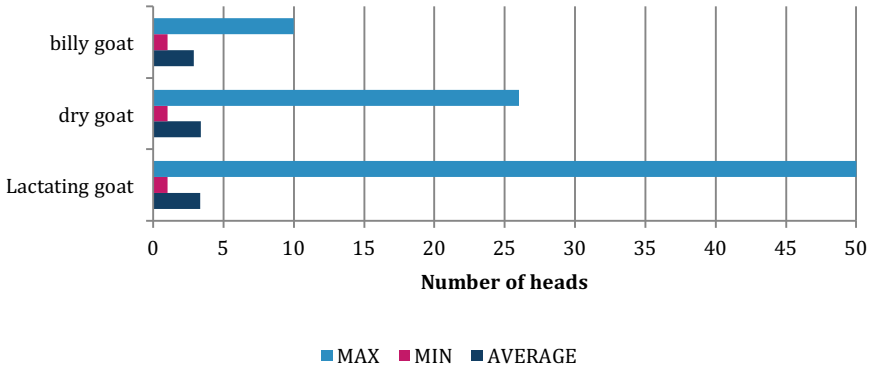

Crops cultivated
99.7 %
20.1%
11.3%
0.5%
0.3%
0.5%
Maize/ Haricot beans
wheat
Teff
Fruits
Khat
Vegetables

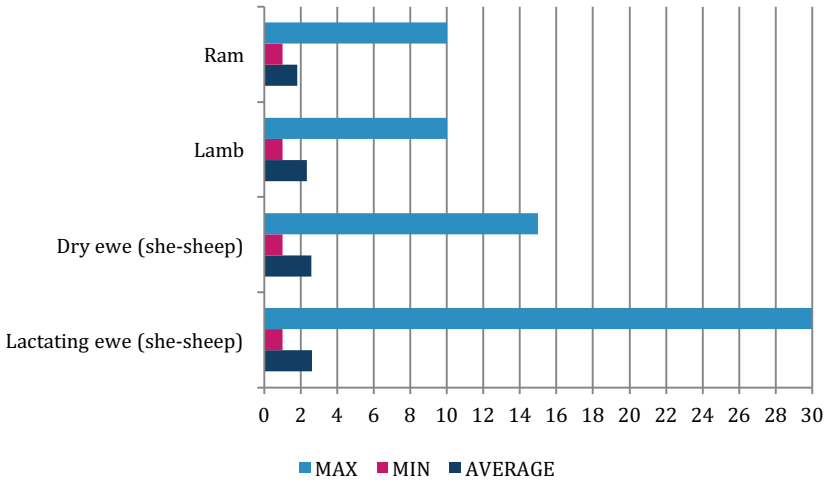

Average surface /HoH (in Timat)
2,12
1,79
1,54
1,50
1
2
Maize/ Haricot beans
wheat
Teff
Fruits
Khat
Vegetables

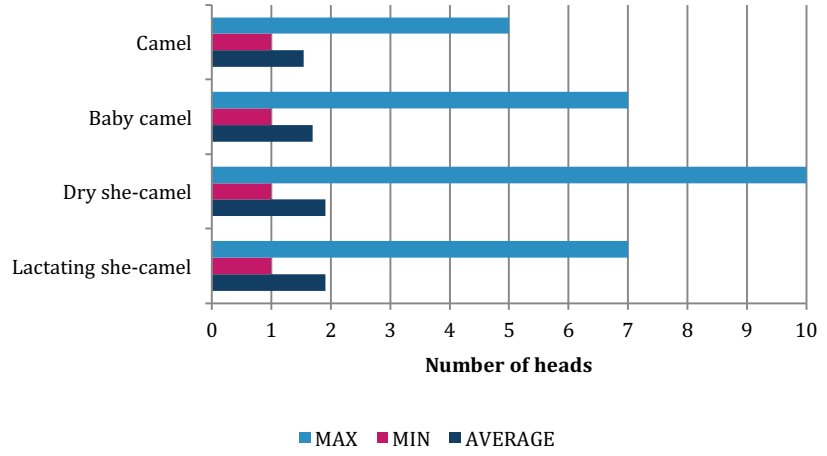

Household's livestock possession
60
50
40
30
20
10
0
Lactating cow
Dry cow
Calves
Bull
Ox
Lactating goat
dry goat
billy goat
Lactating ewe (she- ...
Dry ewe (she-sheep)
Lamb
Ram
Lactating she-camel
Dry she-camel
Baby camel
Camel
donkey/horse

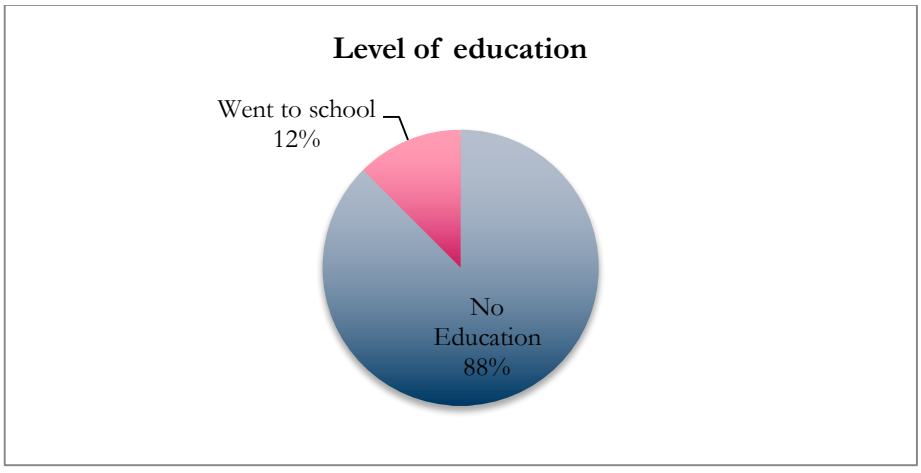

Average number of livestock /HH
1,7
2,9
3,2
2,4
2,6
Bovine
Caprine
Ovine
Camel
Equine


Ox
Bull
Calves
Dry cow
Lactating cow
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32
Number of heads
MAX
MIN
AVERAGE


billy goat
dry goat
Lactating goat
0 5 10 15 20 25 30 35 40 45 50
Number of heads
MAX
MIN
AVERAGE


Ram
Lamb
Dry ewe (she-sheep)
Lactating ewe (she-sheep)
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30
MAX MIN AVERAGE


Camel
Baby camel
Dry she-camel
Lactating she-camel
0 1 2 3 4 5 6 7 8 9 10
Number of heads
MAX MIN AVERAGE


Level of education
Went to school
12%
No
Education
88%

1.8 ANNEXE 7 : SEASONAL CALENDARS

SILALA		J	F	M	A	M	J	J	A	S	O	N	D
Season		Warm dry season (Bona Hagayya)			Long Rainy season (Ganna)		Cold dry season (Adolessa/Bona Ganna)			Short Rainy Season (Hagayya)		Warm dry season (Bona Hagayya)	
Nutrition & Health	peak of admission in center							X	X	X	X	X	X
	perceived acute malnutrition												
	Diarrhea												
	ARI				x	x	x						
	malaria				x	x				x	x		
WASH	Water source dry-up	X	X	X								X	X
	rains												
Livestock	*"Forra"* herd Migration	X	X	X								X	X
	Cattle milk production	X	X	X	XXX	XXX	XX	XX	X	XX	XXX	XX	x
	Cattle breeding												
	Camel milk production	X	X	X	XX	XX	XX	XX	XX	XX	XX	X	X
	Camel breeding												
	Goat milk production	X	X	X	XX	XX	X	X		XX	XX	X	X
	Goat breeding												
	Vaccination						X	X					
	Pasture collection	X	X	X			X	X	X			X	X
	Livestock diseases				X	X				X	X		
	Livestock sales	X	X	x								X	X
Agriculture	Land preparation												
	Seed broadcasting												
	Weeding												

	Harvesting						X	X				X	X
	food shortage /hunger gap		X	XXX	X	X							
Household economy	Food market price		high	high									
	Incomes	XX	X	X	X			X				X	XX
	PSNP												
Social events	Clan meeting (kora gosaa)				x								
	First Child naming (Gubbissa)						x	x					
	Other child naming (Moggati)			x	x	x	x	x			x		
	Gada retiring (Gadaamoojjii)				x	x	x	x					
	Mass feeding (Nyaachisa)							x	x				
	Ceremony of young men (Korbasa)			x	x	x	x	x	x	x	x		
	Circumcision ceremony (Qabanqaba)						x	x					
	Ceremony forbidden												

MIDHAGA		J	F	M	A	M	J	J	A	S	O	N	D
Season		Warm dry season (Bona Hagayya)			Long Rainy season (Ganna)		Cold dry season (Adolessa/Bona Ganna)			Short Rainy Season (Hagayya)		Warm dry season (Bona Hagayya)	
Nutrition & Health	peak of admission in center							X	X	X	X	X	X
	perceived acute malnutrition												
	Diarrhea												
	ARI				x	x	x						
	malaria				x	x				x	x		
WASH	Water source dry-up	x	x	XXX									x
	rains												
Livestock	*"Forra"* herd Migration	X	X	X								X	X
	Cattle milk production	X	X	X	XXX	XXX	XX	XX	X	XX	XXX	XX	x
	Cattle breeding												
	Camel milk production	X	X	X	XX	XX	XX	XX	XX	XX	XX	X	X
	Camel breeding												
	Goat milk production	X	X	X	XX	XX	X	X		XX	XX	X	X
	Goat breeding												
	Vaccination						X	X					
	Pasture collection	X	X	X			X	X	X			X	X
	Livestock diseases				X	X				X	X		
	Livestock sales	X	X	x								X	X
Agriculture	Land preparation												
	Seed												

	broadcasting												
	Weeding												
	Harvesting						X	X				X	X
	food shortage /hunger gap		X	XX X	X	X							
Household economy	Food market price		high	high									
	Incomes	XX	X	X	X			X				X	XX
	PSNP												
Social events	Clan meeting (kora gosaa)				x								
	First Child naming (Gubbissa)						x	x					
	Other child naming (Moggati)			x	x	x	x	x			x		
	Gada retiring (Gadaamoojjii)				x	x	x	x					
	Mass feeding (Nyaachisa)							x	x				
	Ceremony of young men (Korbasa)			x	x	x	x	x	x	x	x		
	Circumcision ceremony (Qabanqaba)						x	x					
	Ceremony forbidden												

DAMBI HORA		J	F	M	A	M	J	J	A	S	O	N	D
Season		Warm dry season (Bona Hagayya)			Long Rainy season (Ganna)		Cold dry season (Adolessa/Bona Ganna)			Short Rainy Season (Hagayya)		Warm dry season (Bona Hagayya)	
Nutrition & Health	peak of admission in center		x		x	x	x	x	x	x			
	perceived acute malnutrition												
	Diarrhea												
	ARI												
	malaria												
WASH	Water source dry-up	XX	XX	XXX									XX
	rains												
Livestock	"*Forra*" herd Migration				x	x				x	x		
	Cattle milk production	x	x	x	x	xx	xx	xx	xx	x	xx	x	x
	Cattle in-heat period												
	Cattle breeding												
	Camel milk production												
	Camel in -heat period												
	Camel breeding												
	Goat milk production												
	Goat in-heat period												
	Goat breeding												
	Mineral lick collection												
	Pasture collection												
	Vaccination						x	x					
	Livestock diseases					x	x	x					
	Livestock sales				x	x							
Agriculture Maize	Land preparation												
	Seed broadcasting												
	Weeding												

	Harvesting								X				
Agriculture Beans	Seed broadcasting												
	Weeding												
	Harvesting												
	food shortage /hunger gap		X	XXX	X	X							
Household economy	Food market price	x	high	high	x								x
	Incomes	XX	X	X	X	X	X	X	XX	X	X	X	X
	PSNP/relief aid												
Social events	Clan meeting (kora gosaa)				x								
	First Child naming (Gubbissa)						x	x					
	Other child naming (Moggati)			x	x	x	x	x			x		
	Gada retiring (Gadaamoojjii)				x	x	x	x					
	Mass feeding (Nyaachisa)							x	x				
	Ceremony of young men (Korbasa)			x	x	x	x	x	x	x	x		
	Circumcision ceremony (Qabanqaba)						x	x					
	Ceremony forbidden												

HARNKA BULE		J	F	M	A	M	J	J	A	S	O	N	D
Season		Warm dry season (Bona Hagayya)			Long Rainy season (Ganna)		Cold dry season (Adolessa/Bona Ganna)			Short Rainy Season (Hagayya)		Warm dry season (Bona Hagayya)	
Nutrition & Health	peak of admission in center		X			X	X	X	X	X			
	perceived acute malnutrition												
	Diarrhea												
	ARI						X	X					
	malaria				x	x				x	x		
WASH	Water source dry-up	x	x	x								X	x
	rains												
Livestock	"*Forra*" herd Migration	x	x	x								x	x
	Cattle milk production	x	x	x	xxx	xxx	xx	xx	x	xx	xxx	xx	x
	Cattle breeding												
	Camel milk production	x	x	x	xx	xx	xx	xx	xx	xx	xx	x	x
	Camel breeding												
	Goat milk production	x	x	x	xx	xx	x	x		xx	xx	x	x
	Goat breeding												
	Vaccination						x	x					
	Pasture collection	x	x	x			x	x	x			x	x
	Livestock diseases				x	x	Oyale	Oyale		x	x		
	Livestock sales	x	x	x								x	x
Agriculture	Land preparation												
	Seed broadcasting												
	Weeding												
	Harvesting						X	X					X

	food shortage /hunger gap		X	XX X	X	X							
Household economy	Food market price		high	hig h									
	Incomes	XX	XX	XX			X teff	X teff				XX	XX
	PSNP												
Social events	Clan meeting (kora gosaa)				x								
	First Child naming (Gubbissa)						x	x					
	Other child naming (Moggati)			x	x	x	x	x			x		
	Gada retiring (Gadaamoojjii)				x	x	x	x					
	Mass feeding (Nyaachisa)							x	x				
	Ceremony of young men (Korbasa)			x	x	x	x	x	x	x	x		
	Circumcision ceremony (Qabanqaba)						x	x					
	Ceremony forbidden												

nk
ca

USAL ANALYSIS

ACTION AGAINST HUNGER

The Link NCA methodology was developed by Action Against Hunger – France with technical support from our scientific committee including multi-sectorial experts and eminent scientists from Tufts University | Friedman School of Nutrition Science and Policy, the French Institute for Development Research (IRD), and World Food Program (WFP).

Its development was made possible by the funding provided by:

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Pour plus d'informations concernant la conception ou la mise en œuvre d'une Link NCA, visitez notre site internet :
www.linknca.org

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