Fill the Nutrient Gap

Nutrition situation analysis framework and decision tool

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List of Acronyms

BMI	Body Mass Index
CFSVA	Comprehensive Food Security and Vulnerability Analysis
CotD	Cost of the Diet
CPI	Consumer Price Index
CT	Cash Transfer
DFID	UK Department for International Development
DHS	Demographic Health Survey
ESAN III	Food Security and Nutrition Strategy
FCS	Food Consumption Score
FNG	Fill the Nutrient Gap
GDP	Gross Domestic Product
GIS	Geographic Information Systems
GNR	Global Nutrition Report
HAZ	Height for Age Z-score
HGSF	Home Grown School Feeding
HIES	Household Income and Expenditure Survey
HIV	Human Immunodeficiency Virus
IFA	Iron Folic Acid Supplement
INAS	National Institute of Social Protection
IYC	Infants and Young Children
IYCF	Infant and Young Child Feeding
MDG	Millennium Development Goals
MMT	Multiple Micronutrient Tablet
MNP	Multiple Micronutrient Powder
MQ-LNS	Medium Quantity LNS
MZN	Mozambican Metical
PAMRDC	Multisectoral Action Plan for the Reduction of Chronic Undernutrition
PLW	Pregnant and Lactating Women
RAI	Rural Access Index
RDA	Recommended Dietary Allowance
RNI	Recommended Nutrient Intake
PRONAE	National School Feeding Programme
SBCC	Social and Behaviour Change Communication
SETSAN	Secretáriado Técnico de Segurança Alimentar e Nutricional (Mozambique Technical Secretariat for Food Security and Nutrition)
SDG	Sustainable Development Goals
SNF	Specialised Nutritious Food
SUN	Scaling up Nutrition Movement
TFR	Total Fertility Rate
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VAD	Vitamin A Deficiency
WHZ	Weight for Height Z-Score
WB	World Bank
WFP	World Food Programme
WRA	Women of Reproductive Age

Definitions

Lean and Harvest Seasons
The CotD modelling results disaggregated by 'lean' and 'harvest' seasons refer to the periods of 'November to January' and 'February to October' respectively.

In a typical year, the lean season is experienced from December to March in Northern Mozambique and between October to February in the Centre and South (FEWSNET 2013). To capture trends across seasons the IOF was conducted over four different time periods of three months each. A secondary analysis of IOF data for the FNG did not reveal clear differences in patterns of expenditure between the plenty and lean seasons. There was however clear variation in the number of foods reportedly consumed during the different seasons.

Based on this analysis, the CotD modelling was carried out using data from the IOF quarters spanning from February to October to represent the plenty season; times where there was a greater availability of food produced/available for purchase. A separate analysis was carried out using the data from the November to January quarter to represent the lean season; a time when the diversity of foods available is less.

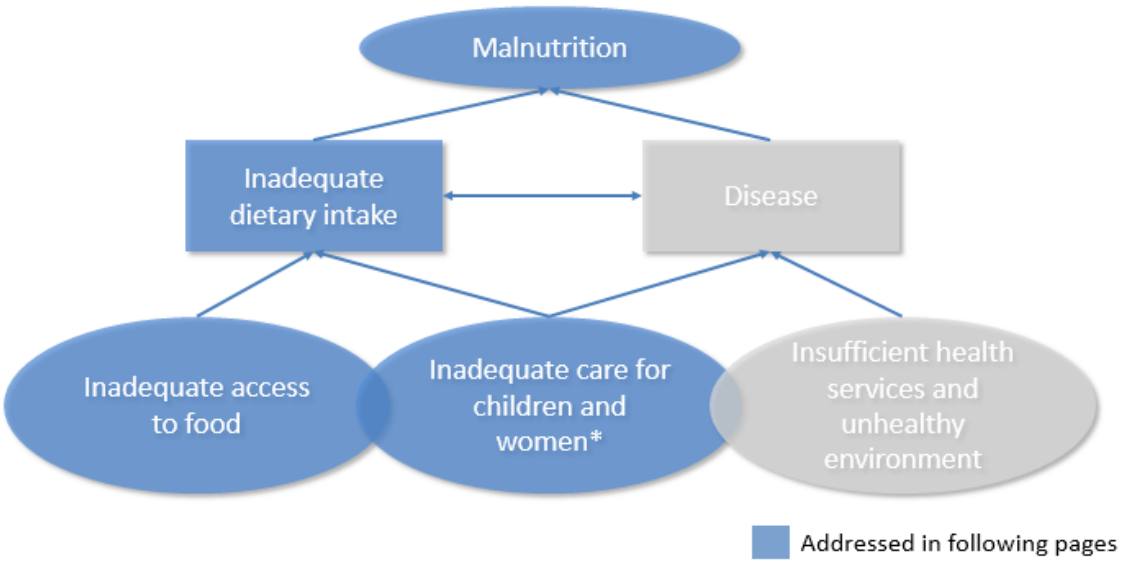
Currency equivalent

Currency Unit	Mozambican Metical MZN
1 USD	34.1 MZN (Average exchange rate from August 2014-August 2015)

Background

WFP, with technical input from key research institutes (University of California Davis, IFPRI, Epicentre, Harvard University and Mahidol University) and UNICEF, developed a framework for strengthened nutrition situation analysis and decision-making, called "Fill the Nutrient Gap", which aims to support identification of strategies for improving nutrition with an emphasis on increasing access to nutrients, especially during the critical period of the first 1,000 days. This tool focuses primarily on the dietary intake side of the malnutrition conceptual framework displayed below:

Figure 1: UNICEF Conceptual Framework for Causes of Malnutrition (UNICEF 1991)



FNG Framework

The 'Fill the Nutrient Gap' tool (FNG) primarily uses secondary data in combination with the results from linear programming tools such as Cost of the Diet (CotD) and Optifood to better understand the barriers to adequate nutrient intake in a country's context and model potential interventions to improve access to nutrients, in particular from nutritious foods and income support. The framework for FNG analysis depicted in Figure 2 helps to consolidate and analyse existing secondary data at country level based on the following categories:

i) Malnutrition Characteristics - review prevalence data of malnutrition characteristics (Stunting, Wasting, Anaemia, Underweight, Micronutrient Deficiencies and Overweight and Obesity) by geographic area, population group and socio-economic status. If relevant, seasonal patterns of various nutritional problems within populations can be considered. Malnutrition characteristics are reviewed in the initial stage to define priority groups for the analysis.

ii) Policy Environment – compile an inventory of national-level policies and programs relevant to the access and availability of nutritious food. This should include information about

coverage and the extent to which policies and programs are implemented. This activity can be used to identify current and potential entry points for nutrition interventions through different sectors including: 1) opportunities to strengthen national policy and 2) national legal or regulatory frameworks related to access and availability. Enforcement of policies and regulations is part of the analysis; for example, while there may be a mandatory national fortification policy, compliance and enforcement may be limited. Existing partnerships (e.g. private public partnerships) and initiatives to improve availability and affordability and consumption of safe, nutritious foods are also identified and reviewed.

iii) Availability of nutritious foods in the local market – review information on local availability of nutritious foods (natural and fortified) as well as on local production and processing capacity to assess whether the local food system can meet nutrient needs. Whenever possible, seasonal effects on availability are also assessed.

iv) Access to Nutritious Foods - determine the extent to which target populations have access to nutritious foods in different urban and rural areas across lean and non-lean seasons, including home production as well as (physical) access to markets. Also understand the adequacy of nutrient intake at the household level and the ability of households to cope with shocks.

v) Nutrient Intake - examine likely or confirmed gaps in nutrient intake at the individual target group level, in particular related to individual dietary diversity, infant and young child feeding practices and the coverage of supplementation and/or fortification programmes.

vi) Local Practices - identify socioeconomic and cultural factors that influence food purchase and feeding practices and act as barriers to adequate nutrient intake. Qualitative studies are particularly useful to gain insights into local preferences and behaviours, which can inform behaviour change strategies to improve feeding practices.

vii) Cost Optimization – The CotD linear programming tool is used to:

a. Determine the (minimum) cost of meeting nutrient needs for all members of a model household[1] in each study area using locally available foods
b. Estimate the proportion of households within the population that would be able to afford a nutritious diet
c. Model the economic and nutritional impact of possible nutrition interventions identified in the secondary data analysis and by stakeholders, such as introduction of fortified foods and/or Specialised Nutritious Foods (SNFs) through market channels or social protection programmes, improving access to nutrient-rich foods through home production or vouchers, price reductions of nutritious foods as well as cash transfers.

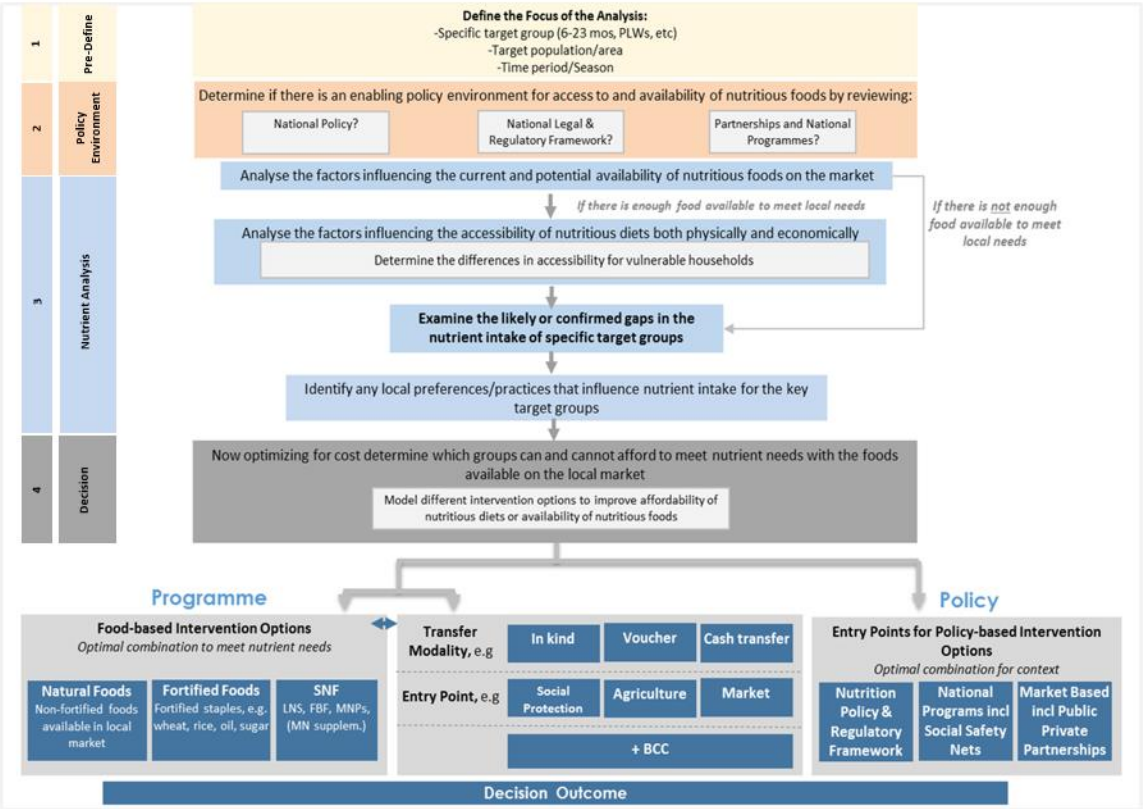
Once this information has been consolidated and analysed, context-specific optimal packages of policy and programmatic interventions can be identified, based on the relative contribution of different interventions to reduce cost and improve affordability of nutritious diets. These strategies and possible entry points can be collectively identified by the different stakeholders once the preliminary results of the analysis are available.

[1] i.e. including individuals from target groups of interest such as a breastfed child, lactating woman, adult man, school-aged child and adolescent girl

Development and rollout of the FNG Methodology

Pilot testing of the "Fill the Nutrient Gap" tool took place in El Salvador, Ghana and Madagascar in 2015-16. The application of this tool was validated in a consultation with the key technical partners in September 2016. Further roll out of the tool began with Guatemala, Tanzania and Pakistan in late 2016, Lao PDR and Cambodia followed early in 2017, and Sri Lanka, Rwanda, Uganda and Niger have now started. More countries are planned for the first half of 2018, including Tajikistan, Ecuador, Sudan, Zimbabwe, Peru, Philippines and Myanmar.

Figure 2: The Fill the Nutrient Gap Framework' for situation analysis and decision making



Methods

The FNG process in Mozambique

Level of analysis

The FNG process followed in Mozambique is outlined in Figure 3 below. The process started in May 2017 with multi-stakeholder inception meetings, led by the Mozambique Technical Secretariat for Food Security and Nutrition (SETSAN) as well as bilateral consultations to introduce the analysis and gather relevant secondary information from stakeholders. During these initial meetings it was decided that the FNG analysis should have a particular focus on target groups within the 1000 days period and adolescent girls (Figure 4). It was also agreed that the FNG analysis would be carried out at the province-level, with disaggregation between urban and rural areas where possible and a separate analysis of Maputo City. The reasons for this were that decision-making for resource allocation and interventions is made at the province level and also, as the main secondary data sources used for the modelling and situation analysis (IOF, DHS, etc.) provide findings at the province-level. In some cases findings were averaged by region (North, Centre, South), in accordance with the divisions used in the DHS (Figure 5).

Figure 3: The FNG Process in Mozambique

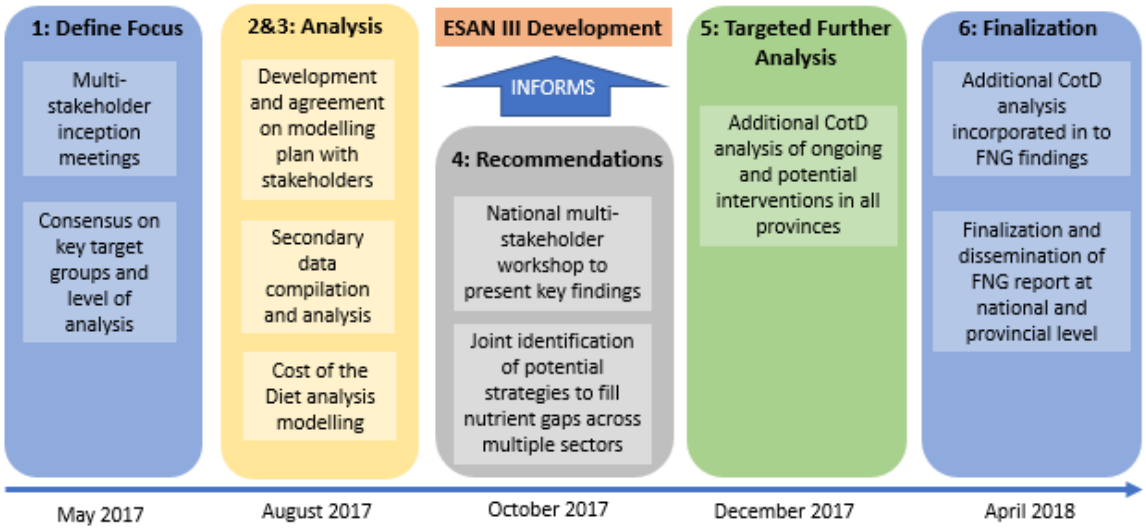


Figure 4: Level of analysis for the Mozambique FNG, as agreed during initial stakeholder consultations

Areas for analysis		**Specific target groups**
Province-level analysis, disaggregating between urban and rural areas where possible		Life-cycle approach, focussing on the first 1000 days • Infants and young children aged 0-23 months • Pregnant Women
Region[1]	Province	
North	Niassa Cabo Delgado	

	Nampula	• Lactating Women • Adolescent girls (pre-pregnancy)
Centre	Zambézia Tete Manica Sofala	
South	Inhambane Gaza Maputo Province *Maputo City*	

[1] Regional distribution of provinces as per the Mozambique DHS (Instituto Nacional de Estatística (INE) et al. 2013)

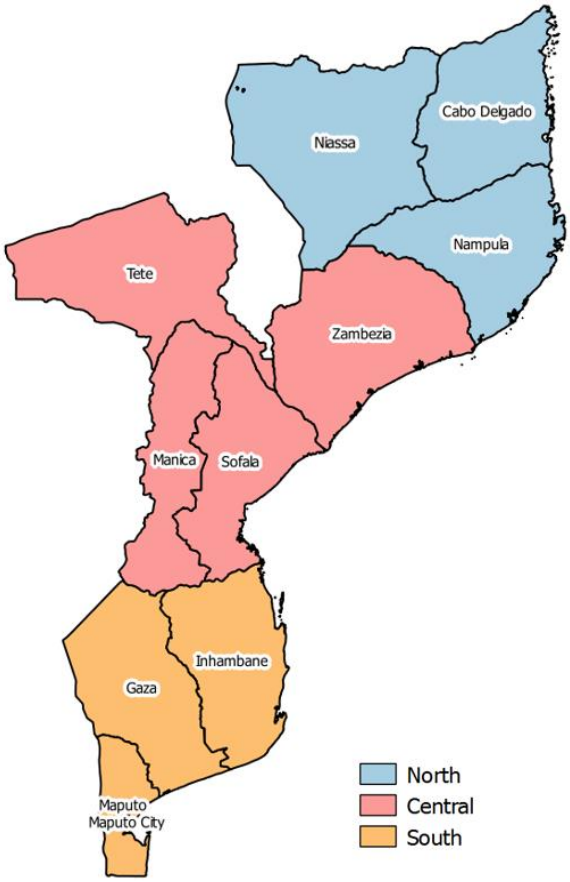


Figure 5: Provinces of Mozambique, divided by regions used in the 2011 DHS (Instituto Nacional de Estatística (INE) et al. 2013)

Intervention modelling plan

Based on early mapping and analysis of secondary data sources carried out in country and consultation with SETSAN, members of the PAMRDC Technical Group and other stakeholders, potential interventions for improving the nutrient intake of key target groups, as well as possible entry points for these interventions across different sectors were identified. A preliminary modelling plan of potential interventions was discussed with stakeholders bilaterally and through the PAMRDC Technical Group meeting during the August 2017 mission, who provided

further detail on multi-sectorial interventions to be modelled using the CotD software. This plan listed key nutrition-specific and nutrition-sensitive interventions for modelling, based on ongoing and potential future interventions. Food price and availability data, for the CotD modelling, was provided by SETSAN, the National Institute of Statistics, and the Ministry of Finance.

In October 2017 key findings from secondary data review and CotD analysis from all provinces and preliminary findings from the intervention modelling in select provinces were shared in a national multi-stakeholder workshop, see Appendix C: Fill the Nutrient Gap Mozambique preliminary findings workshop report (October 2nd, 2017). Representatives from multiple sectors considered potential strategies to fill the identified nutrient gaps and discussed what further analysis would be required to inform planning processes. At the workshop, the gathered stakeholders decided that the secondary data on food prices used for the preliminary analysis was sufficient and that further intervention modelling in all provinces, using secondary inputs, was preferable to collecting primary food prices data in select districts. A process was also initiated to re-circulate the intervention modelling plan and ensure that all interventions of interest were included in the second round of modelling.

Following this, province-level intervention modelling was carried out for all provinces. The findings from this were combined with those of the FNG analysis and presented to a wider group of Stakeholders in early 2018. The dissemination workshop led to the following recommendations and prioritized interventions:

Collation and analysis of secondary data

Between May and October, 2017 the secondary data analysis was carried out by the FNG team. Data sources were identified, mapped and reviewed over three main stages:

1. Consultation with National Stakeholders: Prior to and during the May and August missions to Mozambique, information about the data requirements for the FNG analysis and the FNG data mapping template were shared with the WFP country office and national stakeholders, who, in turn, shared relevant datasets, reports, articles, and documents with the FNG team.

2. Literature Search: In addition to obtaining data through national stakeholders, a literature search was carried out to identify any further articles or reports relevant to the FNG analysis and to provide a contextual overview of the nutrition situation in Mozambique. PubMed and Google Scholar were used to search for studies in academic journals, institutional reports, and working paper series published in the last 10 years relevant to the FNG analysis.

3. Follow up on identified data gaps: Once a data mapping spreadsheet had been populated with information sources from stakeholders and literature review, data gaps, in terms of themes, areas of the country or population groups, were identified. The FNG team shared this list during the multi-stakeholder preliminary findings workshop to inquire whether any additional information sources could be shared. A further, targeted literature search

focussing on these specific gaps was then conducted. Through consultation with national and international stakeholders and a review of relevant literature, over 120 data sources were identified and reviewed (Appendix B: List of sources reviewed for Fill the Nutrient Gap analysis). Out of these sources 47 documents were used and are cited in this report (Reference List). This review identified a number of data gaps that were unable to be filled, as detailed in the 'Data Gaps' section.

Cost of the diet assessment

Cost of the Diet (CotD) is a method and software developed by Save the Children UK to better understand the extent to which poverty affects nutritional status through an impact on financial access to nutritious food. The aim of the tool is to estimate the amount, combination and cost of local foods that would be needed to provide individuals or households with their average needs for energy and their recommended intakes of protein, fat and 13 micronutrients through the use of linear programming optimisation. As shown in Figure 4 above, a CotD analysis was conducted for 21 assessment areas in Mozambique; for urban and rural areas in each of the country's 10 provinces and for Maputo City. Weighted averages based on 2017 population estimates (Instituto Nacional de Estadística 2017) were applied to urban and rural areas to produce provincial level results for CotD analysis.

Food availability and price data

The household consumption component (7-day recall) from the 2014-2015 Inquérito do Orçamento Familiar (IOF) Household Budget Survey was used to obtain food availability and food price data representative at the provincial level. The IOF data collection included four survey rounds from August 2014 – August 2015, capturing food production/ expenditure and consumption across the lean and plenty seasons (Ministerio de Economia e Finanças 2016).

For each assessment area, all foods reportedly consumed by 5% or more of households in the IOF were included in the list of available local foods for CotD modelling. The average estimated price for each food item per assessment area was also used. As such, the final food list for each assessment area represented the local situation in terms of both availability of (local production, market availability and household use of) and access to (prices of) different foods. Food composition data came from the CotD database. When available food compositions came from geographically proximate sources in the CotD database, including Kenya, West Africa and Senegal and Egypt (Appendix Table 1).

Household size and composition

The model household composition for CotD analysis was designed to incorporate the key target groups of interest for the Mozambique FNG, as identified by stakeholders, as well as to represent average household size, as per the IOF. Further, it was decided that the household composition and size would be standard across and within provinces to allow for comparisons between different assessment areas and across the country.

For each assessment area the model household included a child 12-23 months of age, a lactating woman and an adolescent girl (14-15 years old), to represent the key target groups listed in Figure 4 above, as well as a child 6-7 years of age and an adult man. For this analysis the 12-23 month old child is to be used as a proxy for the 6-23 month-old children target group, the child 6-7 years as a proxy for a school aged child and the lactating woman as a proxy for a pregnant

and lactating woman (PLW). The diet of the 12-23mo child was modelled to account for age-appropriate continued breastfeeding. The sex of the 12-23 month old child and the 6-7 years old child was not specified because nutrient intake requirements are not different for boys and girls at those ages.

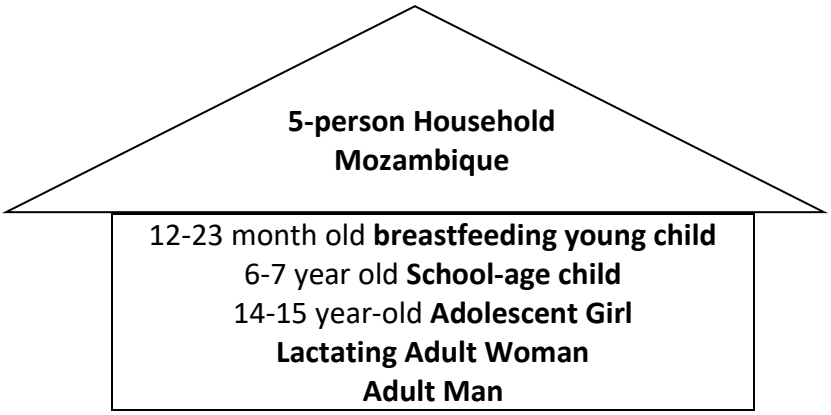


Figure 6: Model household size and composition for each assessment area in the Mozambique CotD Analysis

The CotD nutritious diet

The CotD analysis for FNG uses a staple-adjusted nutritious diet (referred to herein as the Nutritious Diet) which is the lowest cost diet that meets energy requirements and recommended intakes for protein, fat and 13 micronutrients and is inclusive of consumption of the main staple foods for each area. Staple foods are defined as foods that are generally eaten every day by all household members.

For Mozambique the staple foods included maize, cassava, rice and wheat flour[2]. Two servings per day of the local staple/s were modelled for all diets, except the 12-23mo child for whom one serving was modelled. In the Northern provinces a combination of maize and cassava was modelled as staples in rural areas and a combination of maize, cassava, rice and wheat flour were modelled as staples in urban areas. In the Centre and Southern provinces maize was modelled as the staple in rural areas and a combination of maize, rice and wheat flour was modelled as staples in urban provinces (Appendix Table 3: Minimum food frequency constraint rules for servings of staple food per week for the SNUT diet (all household members and 12-23 mo old child) by province).

Affordability analysis

The cost of the nutritious diet becomes a more meaningful figure when compared with the money that households currently have to spend on food. This facilitates an understanding of what percentage of households within the population would realistically be able to afford the nutritious diet. To estimate the percentage of households within the 11 provinces that were unable to afford the nutritious diet, percentiles of per capita monthly food expenditure data

[2] Local staple foods for each assessment area were determined using the IOF consumption data, WFP food security reports and consultations with WFP staff working in sub-offices in each province.

were generated for rural and urban areas within each province based on data in the 2015 IOF. To generate this estimation of food expenditure, food that was produced by households themselves was monetised, as such the cut-offs used for this analysis are inclusive of both food that would be purchased or produced by local households.

Per capita food expenditure figures were multiplied by the number of individuals in a typical household (5) and by the number of days in an average month (30.4) to estimate monthly household food expenditure.

Intervention modelling

In order to improve affordability of the nutritious diet, a number of different interventions, outlined in the analysis plan, were modelled for the key target groups: PLW, children under 2 and adolescent girls. A number of interventions targeting school aged children and the overall household were also modelled. More information regarding the interventions modelled can be found in the 'Modelling Dietary Improvement' section of this report.

The intervention modelling for Mozambique was undertaken across two phases. In the first stage, modelling of selected interventions was undertaken for four provinces only and preliminary results were presented at the October workshop. In the second stage, in response to a request from workshop participants, a more detailed modelling process was undertaken for all provinces. The list of interventions modelled across the two phases are included in the analysis plan.

The individual results from the intervention modelling in all provinces are provided in the appendix of this report (Appendix Table 9).

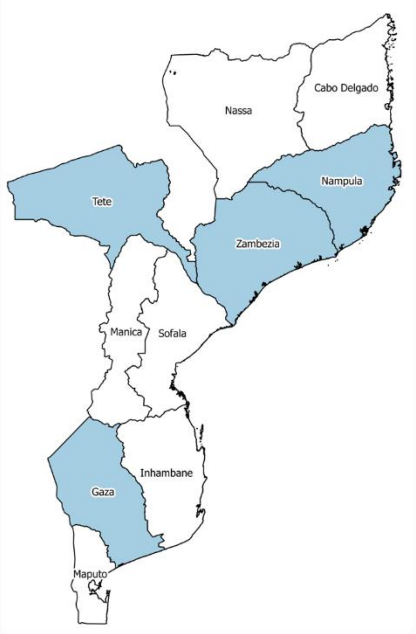


Figure 7: Map of Mozambique with provinces selected for the Phase 1 Intervention modelling highlighted

Introduction

Despite an average GDP annual growth rate of 7.9% for much of the post-war recovery period (1996-2015), economic expansion has only had a moderate impact on poverty reduction and Mozambique ranked 181st of 188 countries in the 2016 Human Development Index[3] (UNDP 2016).

The development challenges Mozambique faces are numerous and varied. Rates of malaria and HIV are high and there is poor and unequal access to improved drinking water and sanitation facilities, as well as health care infrastructure and services. Mozambique is highly susceptible to climate shocks, such as cyclones, floods and drought, as well as economic shocks, most recently the 2016 economic crisis that followed the revelation of previous undisclosed borrowing (World Bank, 2017).

This report seeks to characterise the different factors contributing to the experience of poor nutrition in Mozambique, particularly for the most vulnerable groups, and explore options for improving nutrient intake and access across different sectors. The FNG analysis aims to provide a basis upon which different strategies and intervention packages can be identified that are tailored to local contexts and targeted to improve nutrient intake in key target groups, with a focus on children 6-23 months as well as pregnant and lactating women (PLW) and adolescent girls.

[3] Based on 2015 data

Malnutrition characteristics

Key Message 1: Prevalence of stunting is very high with regional differences and an increasing trend in urban areas. Anaemia is a very severe public health problem in all provinces.

Despite the gradual improvements in economic growth and poverty reduction in recent years, malnutrition continues to affect a large part of the population in Mozambique. The 2017 Cost of Hunger study estimated that 62 billion meticais (USD $ 1.7 billion) were lost in 2015 as a result of malnutrition; equivalent to 10.94% of national GDP (African Union (AU) et al. 2017). The largest share of this cost is the potential loss of productivity as a result of malnutrition-related mortality, estimated at 53 billion meticais (USD $1.3 billion), or 9.4% of GDP (African Union (AU) et al. 2017).

The prevalence of chronic malnutrition, characterised by stunting, remained relatively unchanged between 1997 and 2011, affecting on average half of all infants and young children in Mozambique (Instituto Nacional de Estatística (INE) et al. 2013; WHO 2017). Stunting prevalence varies regionally with higher rates in the Northern Provinces. Whilst prevalence is higher in rural areas of the country, stunting is on the rise in urban areas, presenting an increasing challenge. Wasting, an indicator of acute malnutrition, is at medium levels (5-10%) in almost all Northern and Centre provinces while prevalence is low in the South (<5%) (WHO 2017).

Anaemia is a significant public health concern in Mozambique and prevalence is at severe levels: 54% for women (Instituto Nacional de Estatística (INE) et al. 2013) and 63.8% for children in all provinces (Instituto Nacional de Saúde (INS) & Instituto Nacional de Estatística (INE) 2015). Simultaneously, the prevalence of overweight and obesity amongst women is reportedly increasing nationwide but is highest in the Southern provinces and in urban areas, affecting over a third of women (Instituto Nacional de Estatística (INE) et al. 2013).

The anthropometric data presented in the following sections are taken from the 2011 Demographic and Health Survey (DHS)[4]. This data is representative at a national level as well as separately for urban and rural areas within each of the 10 provinces and for Maputo City. At the time of conducting the FNG analysis, the full results and data from the 2015 DHS were not yet available. New insights from the 2015 survey are eagerly anticipated.

[4] 13,964 households, including 10,313 children aged <5 years (Instituto Nacional de Estatística (INE) et al. 2013)

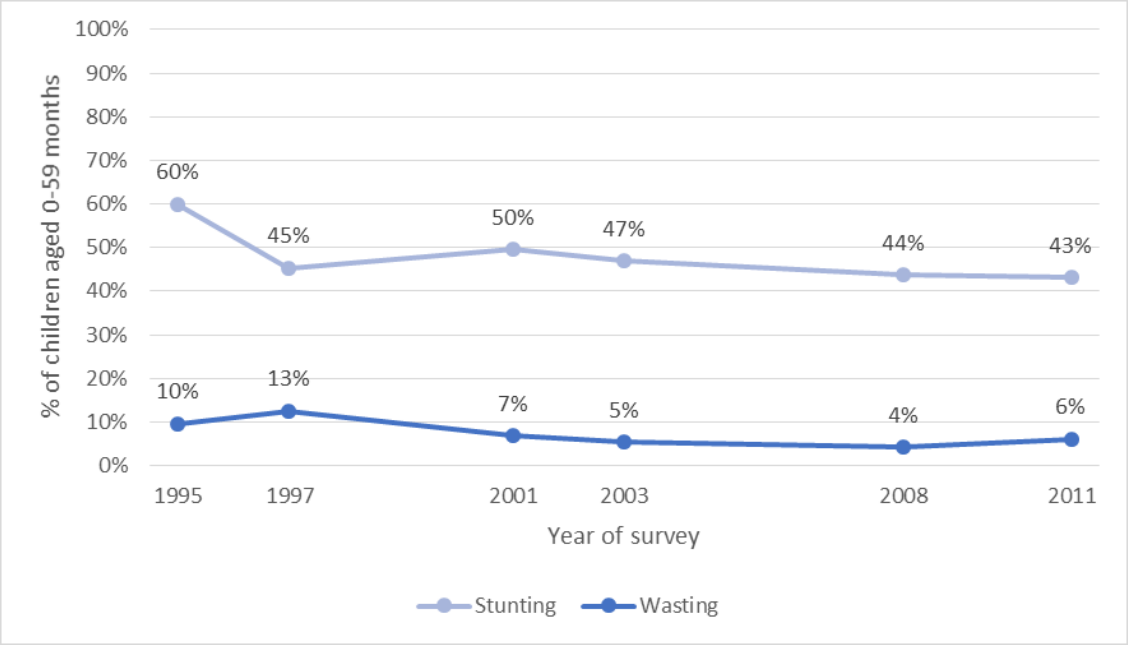
Nutritional status of children under the age of 5 years

Child undernutrition: trends and regional differences

As per the 2011 DHS, the most recently published, nationally representative anthropometric survey the prevalence of stunting (HAZ≤-2) in Mozambique is 43%, classified as *very high* by WHO standards and only a slight reduction from 45% in 1997 (Figure 8) (Instituto Nacional de Estatística (INE) et al. 2013; World Health Organisation 2016; WHO 2017). At this prevalence rate, an estimated **2.15 million children aged under five are affected by stunted growth in Mozambique**. As a consequence, Mozambique ranked 123rd out of 132 countries for stunting prevalence in the 2016 Global Nutrition Report (GNR) (International Food Policy Research Institute 2016; WHO 2017). Stunted growth as a result of frequent or chronic infections and inadequate nutrition following, or even before birth, is an indicator of chronic malnutrition, which itself is an important cause of morbidity and mortality in infants and children (Stevens et al. 2012).

Conversely, wasting in children, indicated by low weight for height, is a symptom of acute malnutrition, usually as a consequence of insufficient food intake or infections, especially diarrhoea. Wasting increases the risk of death, by 3 times for moderate wasting and 9 times for severe wasting (World Health Organisation 2016). The prevalence of wasting in the 2011 Mozambique DHS was 6% nationally, classified as *medium* by WHO standards and placing Mozambique 78th out of 130 countries in the 2016 GNR, a considerable reduction from the 1997 prevalence of 13% (Figure 8), yet still meaning that **more than 300,000 children are affected by wasting** at any point in time (note that total number of cases in a year is even higher) (Instituto Nacional de Estatística (INE) et al. 2013; World Health Organisation 2016; International Food Policy Research Institute 2016; WHO 2017).

Figure 8: Trends in Stunting[1] and Wasting[2] prevalence for children aged 0-5 years in Mozambique 1995-2011



[1] Stunting, an indicator of chronic malnutrition is defined as Height for Age Z score (HAZ) of ≤-2 as per WHO standards (World Health Organisation 2016)

[2] Wasting, an indicator of acute malnutrition, is defined by Weight for Height Z score (WHZ) of ≤--2 as per WHO standards (World Health Organisation 2016)

Stunting prevalence is *very high* (>40% of IYC<5 years) in over half of Mozambique's 10 provinces, all located in the North and Centre, as per the 2011 DHS (Instituto Nacional de Estatística (INE) et al. 2013). Further, stunting appears to be correlated with latitude; rates are lowest in the South at 22.7% in Maputo, increasing to 36% travelling North to Inhambane, reaching 45% in Zambezia and finally 55% and 53% respectively in the Northernmost provinces of Nampula and Cabo Delgado (Figure 9) (Instituto Nacional de Estatística (INE) et al. 2013). The experience of wasting also varied geographically with lower levels in the South and medium prevalence in Centre and Northern provinces (Figure 9).

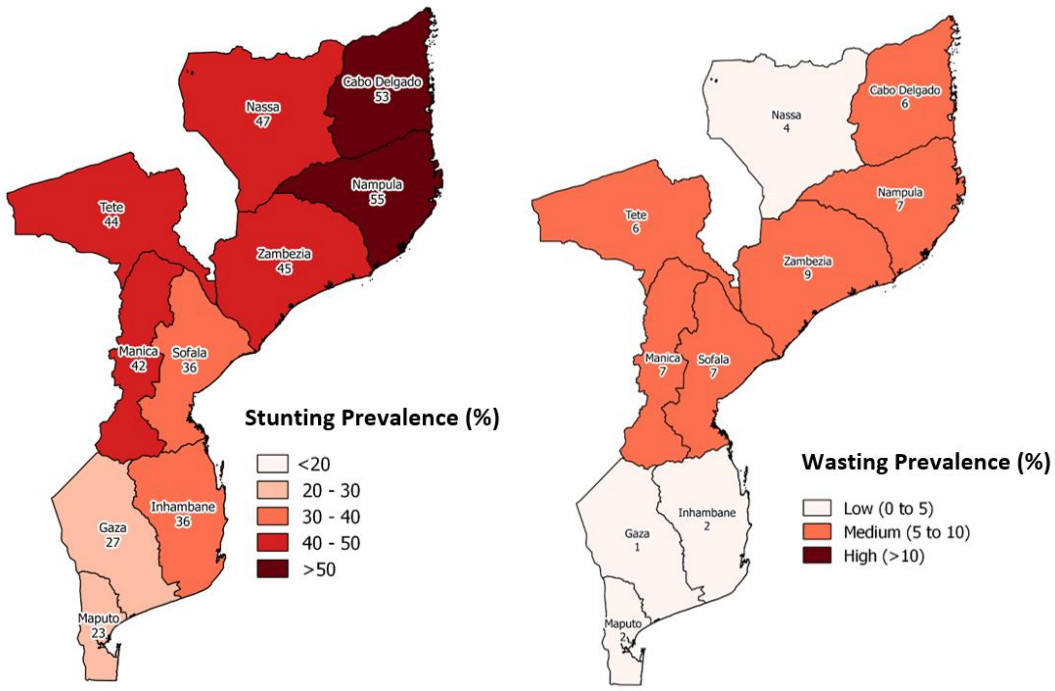
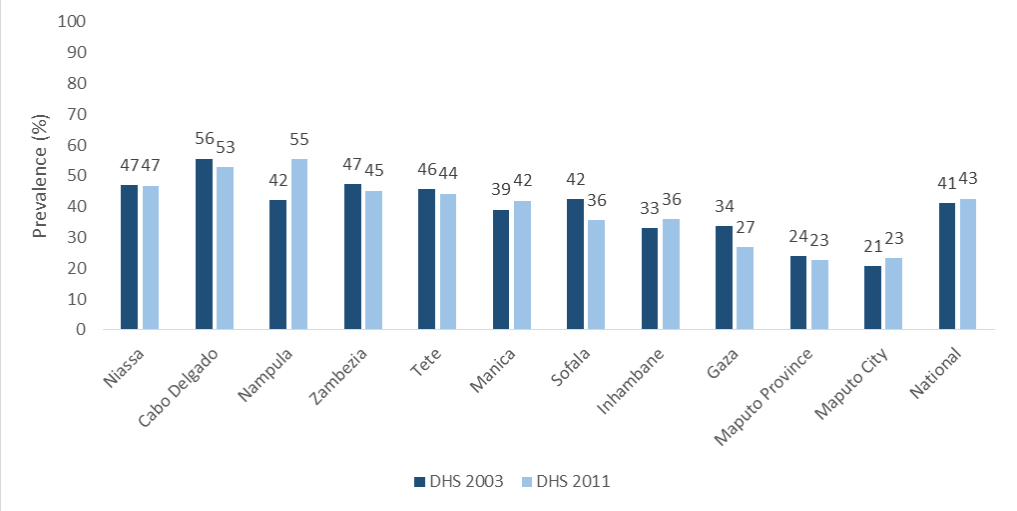


Figure 9: Severity of Stunting and Wasting Prevalence by Province, as per the 2011 Mozambique DHS (Instituto Nacional de Estatística (INE) et al. 2013)

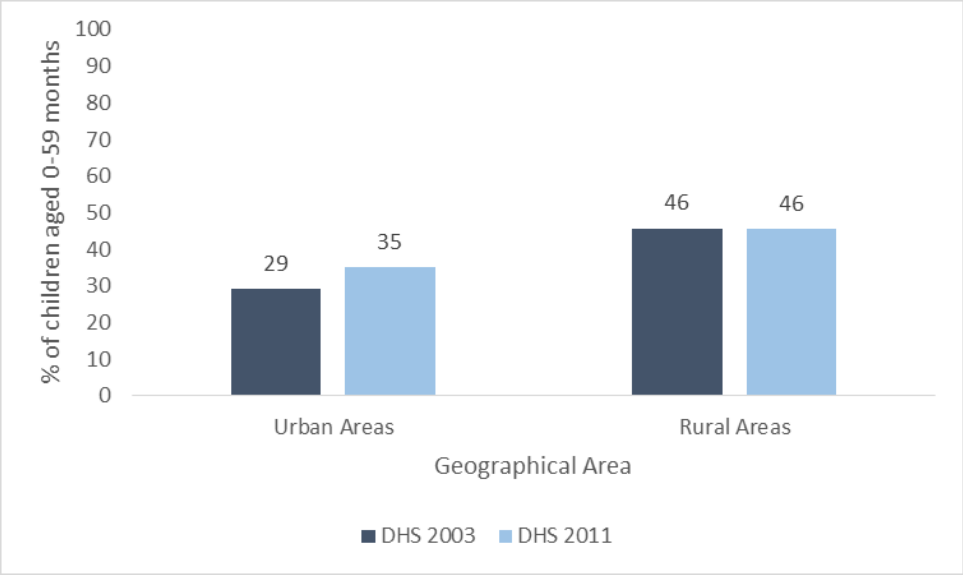
Trends in stunting prevalence based on Mozambique's two most recent DHS' (2003 and 2011) have differed across provinces (Figure 10). In the North stunting prevalence increased in Nampula by almost a third (from 42% to 55%), remained unchanged in Niassa and decreased in Cabo Delgado from 56% to 53%. In the Centre stunting prevalence decreased in all provinces except Manica where it increased from 39% to 42%. In the South, stunting prevalence decreased in Gaza by 20% (from 34% to 27%) and increased by 9% in neighbouring Inhambane. Stunting prevalence decreased slightly in Maputo province (from 24% to 23% prevalence) and increased in Maputo city (from 21% to 23% prevalence) (Instituto Nacional de Estatística (INE) et al. 2013).

Figure 10: Stunting prevalence in the 2003 DHS and 2011 DHS by province (Instituto Nacional de Estatística (INE) & Ministério da Saúde (MISAU), 2003; Instituto Nacional de Estatística (INE) et al., 2013)



Stunting prevalence was higher overall in rural (46%) compared to urban areas (35%) in both recent DHS' (Figure 11). Whilst prevalence in rural areas remained unchanged between 2003 and 2011 however, it increased by 21% in urban areas, despite relative stability in the proportion of the population living in urban areas across the same time period (Instituto Nacional de Estatística (INE) et al. 2013). This suggests that the increase in urban stunting prevalence was more likely to reflect a deterioration of the nutrition situation in these areas as opposed to migration of rural families with a higher proportion of stunted children to urban areas.

Figure 11: Stunting prevalence in urban and rural areas in the 2003 and 2011 DHS' (Instituto Nacional de Estatística (INE) & Ministério da Saúde (MISAU), 2003; Instituto Nacional de Estatística (INE), Ministério da Saúde (MISAU), & Measure Direct, 2013)



Factors associated with child undernutrition

Studies focussing on the major sociodemographic, health and environmental determinants of stunting among children in Tete province[5] and the household and individual factors associated with undernutrition in Zambezia[6] found that several factors were associated with stunting (Garcia Cruz et al. 2017; Rose et al. 2015). Among children surveyed in Tete, birthweight, maternal occupation and educational attainment, living in a rural area, family size, number of children under five in the household, cooking with charcoal, inhabiting wooden or straw housing or housing without proper floors, duration of breastfeeding and duration of exclusive breastfeeding and time of initiation of complementary feeding were all significantly related to stunting (Garcia Cruz et al. 2017). Among children surveyed in Zambezia, vitamin A supplementation was associated with a decreased odds of stunting and exclusive breastfeeding and household food security were associated with a decreased odds of wasting (Rose et al. 2015). The diversity of factors found to be associated with stunting in these studies suggests multidimensional interventions should be considered to address stunting and that future studies are needed to better understand inter-household dietary diversity patterns related to children under five (Garcia Cruz et al., 2017; Rose et al., 2015).

The findings from these two studies are aligned with those of the 2011 DHS, which found that prevalence of stunting and wasting was highest amongst groups of children born to mothers who were thin (Body Mass Index (BMI) <18.5) (Figure 12) (Instituto Nacional de Estatística (INE) et al. 2013). The 2011 DHS found that although stunting and wasting prevalence were highest for the poorest wealth quintile (51%) stunting prevalence among children in the richest wealth quintile was 24% (Figure 13) (Instituto Nacional de Estatística (INE) et al. 2013). The 24%

[5] A case-control study of 282 children aged under five years from May 1 to June 3 2014
[6] A cross-sectional survey of ~4000 female heads of household from August to September 2010

stunting prevalence in the richest wealth quintile is likely related to the fact that only a small proportion of the households in the richest quintile are actually rich, i.e. there is high inequality of the levels of poverty and income, as clearly demonstrated in the graph showing the distribution of per capita daily food expenditure from the 2015 IOF (Figure 14).

Figure 12: Stunting and wasting prevalence amongst children aged 0-59 months grouped by nutritional status of their mother using BMI

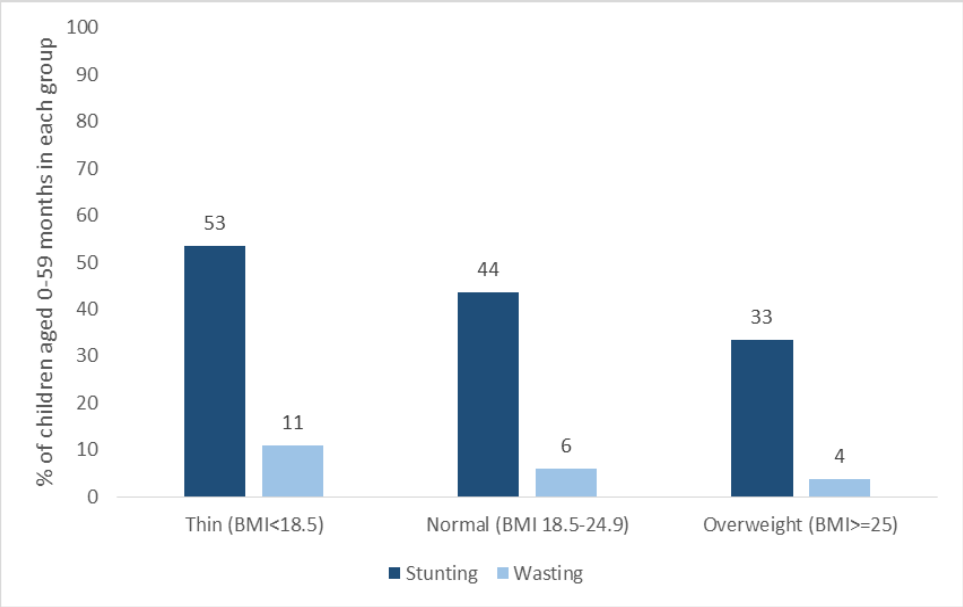


Figure 13: Stunting and wasting prevalence amongst children aged 0-59 months by wealth quintile

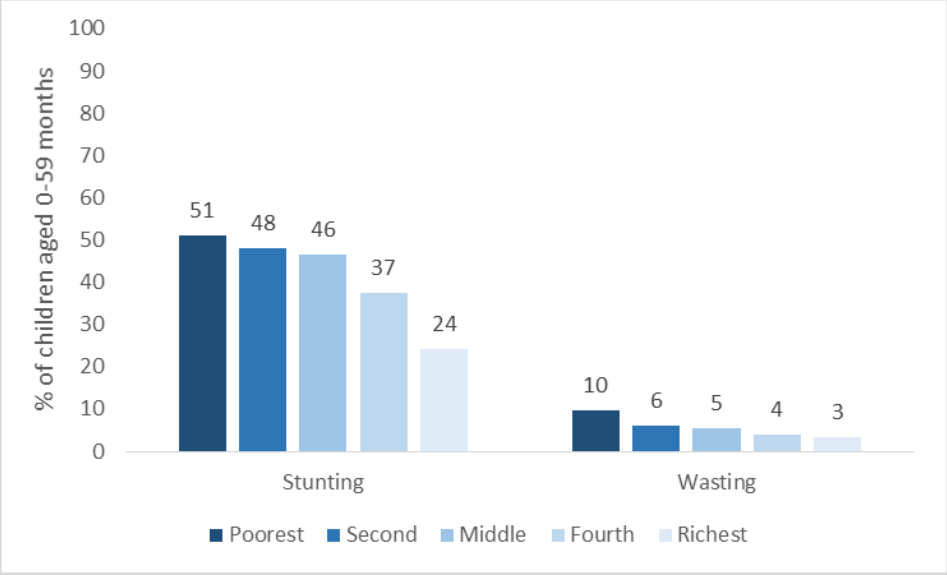
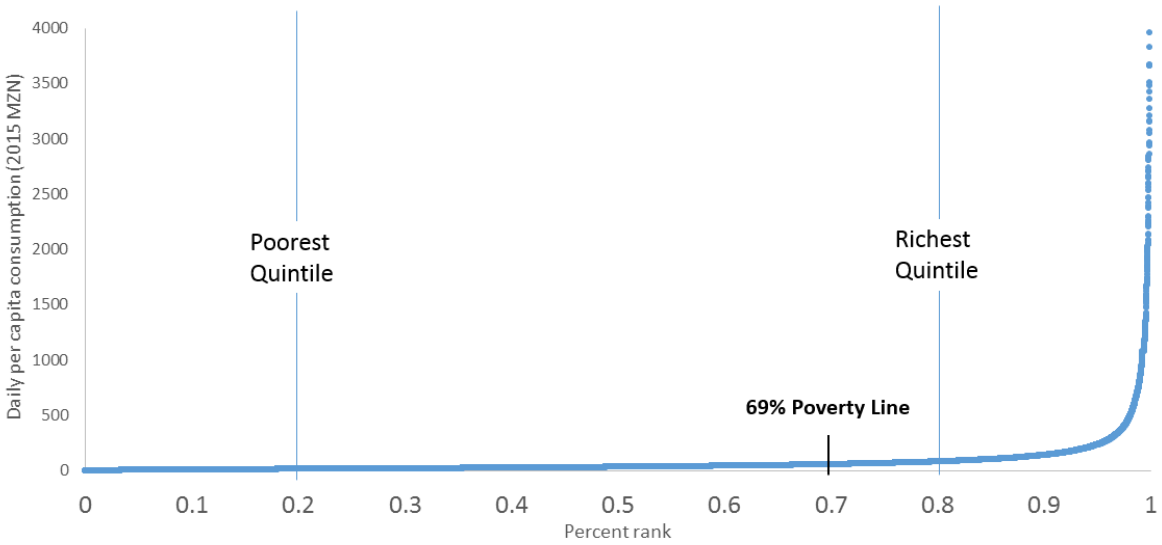


Figure 14: Daily per capita food expenditure[1] by percentiles of the population in Mozambique from the most recent Household Consumption and Expenditure Survey (Ministerio de Economia e Finanças 2016; World Bank 2017a)



[1]Expenditure includes cash expenditure on food as well as monetised own-production of food for consumption

Low birthweight

Low weight of infants at birth, defined as less than 2500 grams, is reflective of poor maternal health and nutritional status and results from inadequate nutrition before conception and/or during pregnancy, short maternal stature and/or young age of the mother. Of the 51% of infants who were weighed at birth[7], according to the 2011 DHS, 14% were considered to be too small (Instituto Nacional de Estatística (INE) et al. 2013). However, this assessment was based largely on maternal recall and categorisation of their child as small, average or large at birth and not a uniform definition or measurement (Instituto Nacional de Estatística (INE) et al. 2013).

Micronutrient deficiencies and anaemia

The prevalence of anaemia in children aged under five years is a very severe public health problem in all provinces, based on preliminary findings in the forthcoming 2015 DHS report. Prevalence was highest in Cabo Delgado and Zambezia, where roughly three in every four children under five are anaemic (Ministério da Saúde (MISAU) & Instituto Nacional de Estatística (INE) 2015) (Figure 15 and Appendix Figure 1).

According to two recent studies[8], anaemia prevalence for IYC in Mozambique is associated with underweight, malaria and HIV infection (Moraleda et al. 2017; Casmo et al. 2014). Iron deficiency accounted for more than half of anaemia cases, suggesting that nutrition

[7] Based on health card records or maternal recall

[8] 1. A case-control study surveying 443 anaemic preschool-aged children at the Manhica District Hospital in Southern Mozambique and 289 community controls randomly selected from the Centro de Investigacao em Saude de Manhica's (CISM) Demographic Surveillance System (DSS) (Moraleda et al. 2017)
2. A cross-sectional survey of 1,015 children from 5 to 12 years old in Nampula, Cabo Delgado and Niassa that included diagnosis of hookworm infection and urinary schistosomiasis and measurement of hemoglobin levels (Casmo et al. 2014).

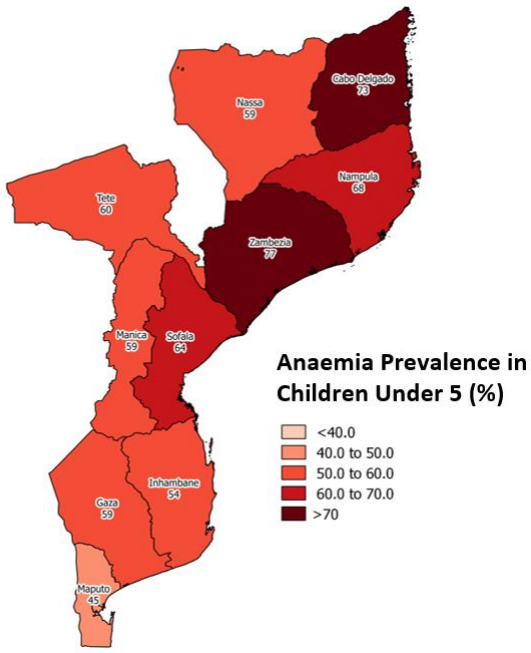
interventions targetting iron intake could reduce the burden of anaemia for IYC (Moraleda et al. 2017). Hookworm and schistosomiasis infection were associated with anaemia among schoolchildren in Cabo Delgado but high anaemia rates (above 60%) were also found amongst children without parasitic infections in other provinces. This suggests that, whilst interventions targetting parasitic infections are important, they are not enough to reduce anaemia prevalence if implemented alone and approaches that address multiple determinants are needed (Casmo et al. 2014).

The most recent data available on vitamin A status of children in Mozambique, collected by the Ministry of Health in 2001-2002, found that 71% of children were vitamin A deficient (VAD) with serum retinoll concentrations below 0.70 $\mu mol*L^{-1}$ (Aguayo et al. 2005). Without more recent data available on vitamin A deficiency it is difficult to estimate the current prevalence; however, there has been some improvement in intake of vitamin A rich foods among children 6-23 months old from 50% in the 2003 DHS to 71% in the 2011 DHS and in vitamin A supplementation from 50% of children 6-59 months in the 2003 DHS to 75% in the 2011 DHS (Instituto Nacional de Estatística (INE) & Ministério da Saúde (MISAU) 2003; Aguayo et al. 2005).

Among children 6-23 months the 2011 DHS found that 71% consumed vitamin A rich foods and 45% consumed iron rich foods in the last 24 hours (Instituto Nacional de Estatística (INE) et al. 2013). Vitamin A consumption for children 6-23 months was lowest in Inhambane (55%), Manica (57%), Gaza (60%) and Maputo City (60%); iron consumption was lowest in Gaza (21%), Maputo City (28%), Inhambane (30%), Manica (32%) and Cabo Delgado (34%) (Instituto Nacional de Estatística (INE) et al. 2013).

Among children 6-59 months the 2011 DHS found that 75% received vitamin A supplementation in the last 6 months and 24% received iron in the last 7 days (Instituto Nacional de Estatística (INE) et al. 2013). Vitamin A supplementation for children 6-59 months was lowest in Zambezia (58%), Cabo Delgado (62%) and Niassa (69%); iron supplementation was lowest in Maputo City (11%), Manica (13%), Maputo Province (14%), Gaza (17%) and Cabo Delgado (19%) (Instituto Nacional de Estatística (INE) et al. 2013).

Figure 15: Severity of anaemia prevalence for children aged 0-59 months by province (Ministério da Saúde (MISAU) & Instituto Nacional de Estatística (INE) 2015)

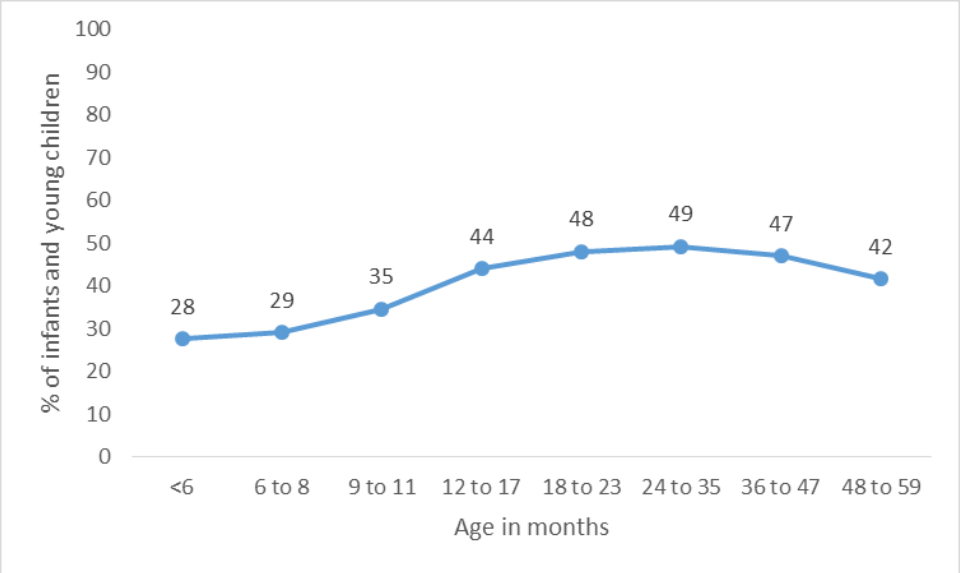


Trends in child malnutrition by age

The 2011 DHS found that 28% of children under six months were already stunted (Figure 16) (Instituto Nacional de Estatística (INE) et al. 2013). The period between birth and six months of age should be the exclusive breastfeeding period, when all children's nutrition needs are met by stores that they're born with and their mother's breastmilk. High stunting prevalence before complementary feeding is supposed to have begun is indicative of poor maternal nutrition status before, during and immediately following pregnancy, including young age (adolescent pregnancy) as well as poor breastfeeding practices.

The increase in stunting prevalence in subsequent age groups, peaking at 49% stunting prevalence for children 24-35 months is suggestive of inadequate nutrient intake and absorption often accompanied by illness or infection. This is likely due to inadequate quality (nutritional and hygienic safety) and frequency of complementary feeding and increased susceptibility to infection (especially diarrhoea) when children increasingly encounter pathogens as they become more mobile and begin eating different foods.

Figure 16: Stunting prevalence by age group (in months) for children in Mozambique (Instituto Nacional de Estatística (INE) et al. 2013)



Nutritional status of women

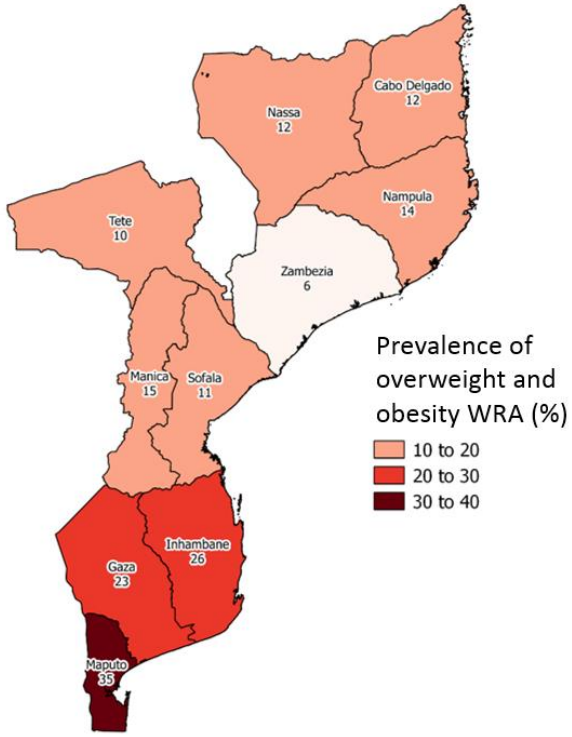
At the national level, the percentage of women of reproductive age (WRA) determined to be overweight or obese (BMI>25%) increased slightly from 14% in 2003 to 16% in 2011 (Instituto Nacional de Estatística (INE) et al. 2013; Instituto Nacional de Estatística (INE) & Ministério da Saúde (MISAU) 2003). WRA overweight and obesity varies greatly by province however and is highest in the South, especially in Maputo where the 2011 prevalence was more than two times that of any Centre or Northern Province (Figure 17 and Appendix Figure 2). Similarly, WRA obesity and overweight prevalence was higher in urban areas compared with urban areas (27% and 11% respectively) (Instituto Nacional de Estatística (INE) et al. 2013).

Older women are more likely to be overweight or obese, whilst adolescent girls (aged 15-19 years) are more likely to be thin or have short stature. A quarter of women aged 40-49 years (25.4%) had BMIs above 25 compared to a fifth of 30-39 year olds (21.1%), 14.1% of 20-29 year olds and only 6.9% of adolescent girls aged 15-19 years (Appendix Figure 3). Similarly, 14.5% of adolescent girls were thin (BMI <18.5) compared to 6-9% of older women (Appendix Figure 3). Lastly the prevalence of short stature (<145cm) was highest for adolescent girls at 7.1%, and decreased with age; 3.7% for women aged 20-29 years, 3.5% for 30-39 and 2.5% for 40-49 (**Error! Reference source not found.**).

The anthropometric results for WRA from the 2015 DHS are eagerly anticipated to assess whether the trend towards increasing Overweight and Obesity is continuing and at what pace.

Anaemia is also a very significant public health problem among WRA, in all provinces, as per the 2011 DHS, with little variation between provinces in the North, Centre and South (Instituto Nacional de Estatística (INE) et al. 2013) (Appendix Figure 2**Error! Reference source not found.**).

Figure 17: Province-level prevalence of overweight and obesity among women of reproductive age by severity (Instituto Nacional de Estatística (INE) et al. 2013)



Availability of and access to nutritious foods

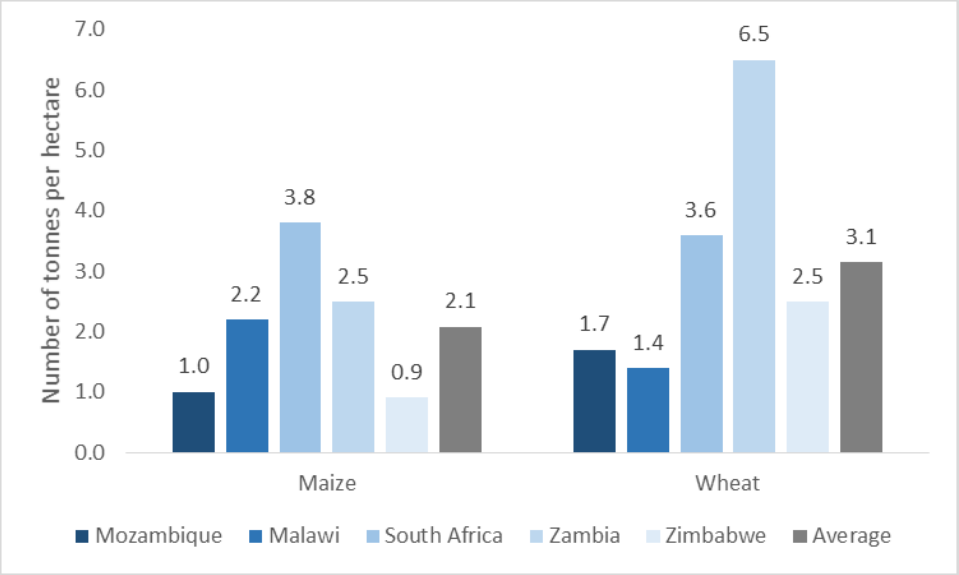
Key Message 2: Availability of nutritious foods is poor, especially in rural areas. Agricultural production is dominated by maize and cassava and productivity and access to markets is low.

The most recent Comprehensive Food Security and Vulnerability Analysis (CFSVA) found that most local markets throughout Mozambique mainly sold commercially manufactured products such as oil, soap, sugar and salt (World Food Programme 2010). Few markets had fresh fruits and vegetables and the most commonly available food products were maize and rice (World Food Programme 2010).

Mozambique is a predominately agrarian society with a majority rural population (Instituto Nacional de Estatística (INE) et al. 2013). Over two thirds (69.5%) of the population live in rural areas and 80% of all households and 90% of rural households are relying on agriculture as their main source of income (The World Bank 2016; Instituto Nacional de Estatística (INE) et al. 2013). Surprisingly however, the agricultural sector only accounts for 25% of national GDP (services account for 53%, manufacturing accounts for 10% and industry accounts for 12%) and growth has been unsteady and slow in recent years (The World Bank 2016). Compared with other countries large productivity gaps are observed in the productivity of maize and wheat (Figure 18). In addition to poor productivity, many farmers have poor access to markets, meaning they

often are forced to sell their produce for low prices as there are few options for sale (The World Bank 2016).

Figure 18: National wheat and maize yields (average no. tonnes per hectare) for five countries in the Southern Africa region in 2013 (World Bank Group 2016)



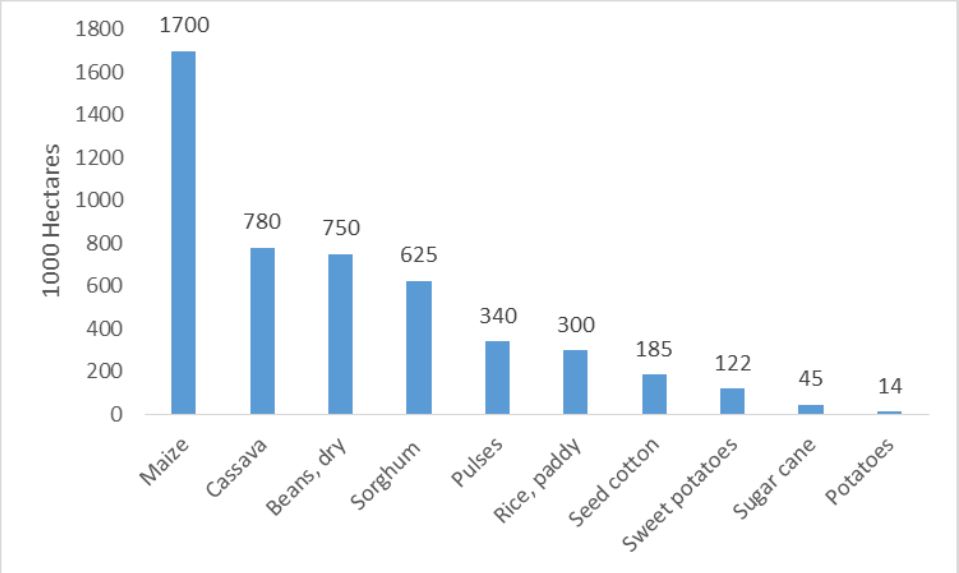
Only 2% of farmers have a land title (The World Bank 2016). Nearly all farmers are smallholders (99% have less than 10 hectares of agricultural holdings and 97% have less than 5 hectares of agricultural holdings) and the average household field area is 1.7 hectares (The World Bank 2016). Most land is farmed under continuous cultivation, which can contribute to soil degradation and increase the need for fertilisers (The World Bank 2016). As shown in Table 1, few farmers use modern inputs and techniques and only 3% use irrigation systems (The World Bank 2016). Further, access to credit services to invest in such agricultural inputs is poor (The World Bank 2016). Increasing the size of agricultural holdings would require labour saving technologies such as cultivators and herbicides (Leonardo et al. 2015).

Table 1: Proportion of all farmers adopting productivity enhancing technologies (The World Bank 2016).

Technology adoption	**(%)**	**Access to services**	**(%)**
Improved seeds	8.8	Agricultural extension	6.6
Irrigation	2.7	Agrarian association membership	4.5
Inorganic fertilizer	2.6	Rural credit	2.0
Pesticides	5.0		

Most farm land is used for subsistence farming to cultivate staple, rather than cash crops. Six staples; maize, pulses, cassava, groundnuts, rice and sorghum, account for 85% of total farmland use, with maize accounting for around one-third of all crop land (Figure 19) (The World Bank 2016).

Figure 19: Land use (per 1000 hectares) for agricultural production by crop type, Mozambique (World Bank Group 2016)



A survey of 1,186 small- and medium-holder farmers in 2008 and 2011 in Nampula, Zambezia, Tete, Manica and Sofala found that on average households cultivated 5.3 crop types with significant variation by province in the types of crops cultivated (Figure 20-Figure 24) (Turner 2014). In Nampula, cassava was the dominant crop in terms of land allocation (32%), whilst in Zambezia, Tete, Manica and Sofala, maize dominated, covering more than half of all productive land in Tete and Manica (Turner 2014). Pigeon peas was commonly cultivated in Zambezia, along with maize, cassava and sorghum (Turner 2014). Cassava and Sorghum were rarely grown in Tete, with households instead growing beans, vegetables (horticulture) and some tobacco, typically under contract with large firms providing inputs and extension advice (Turner 2014). Only 5% of cultivated land in Mozambique was devoted to cash crops, identified as cotton, tobacco, cashew, sugar and tea (Turner 2014).

Figure 20: Farming land allocation according to crop type (%) in Nampula Province (Turner et al. 2013)

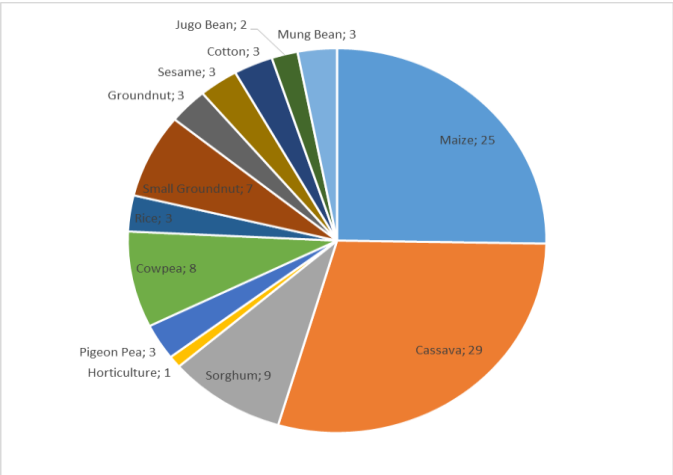


Figure 21: Farming land allocation according to crop type (%) in Zambezia Province (Turner et al. 2013)

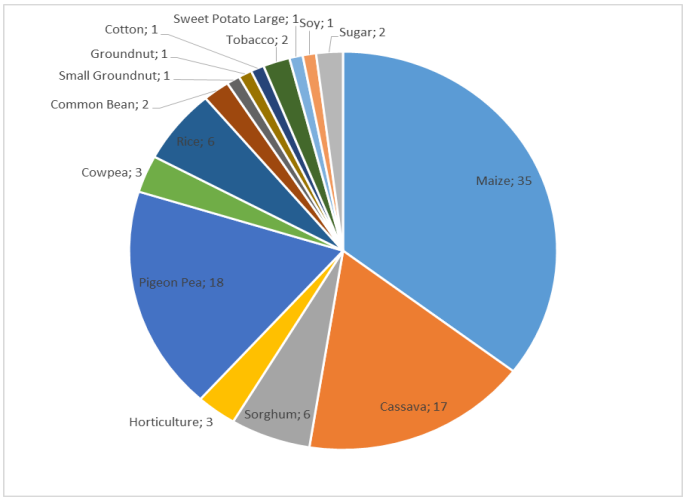


Figure 22: Farming land allocation according to crop type (%) in Tete Province (Turner et al. 2013)

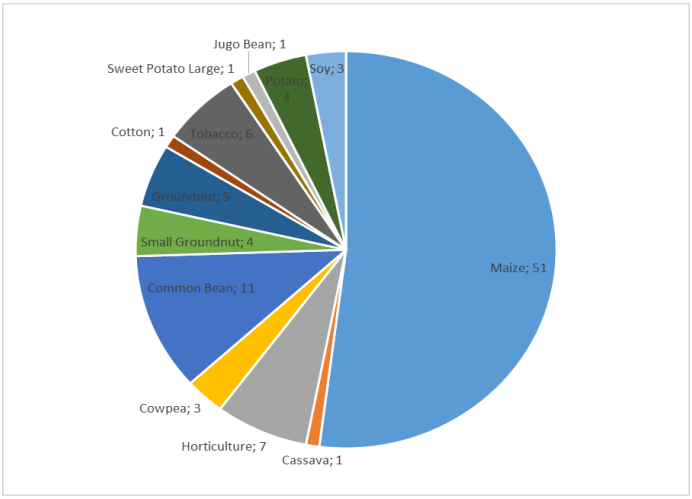


Figure 23: Farming land allocation according to crop type (%) in Manica Province (Turner et al. 2013)

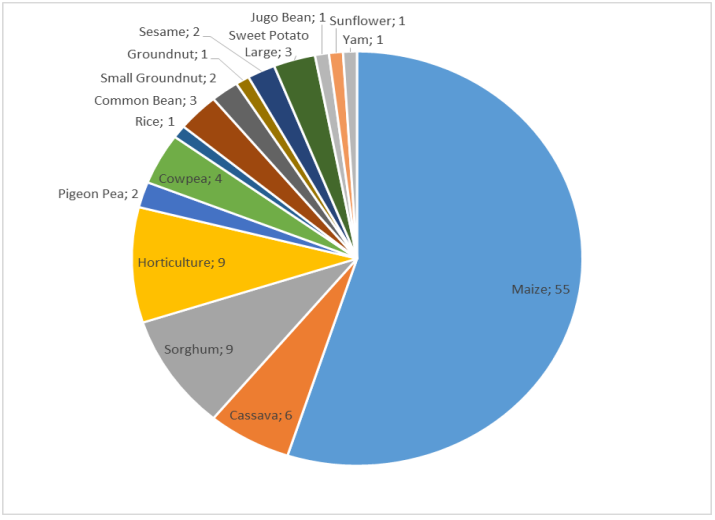
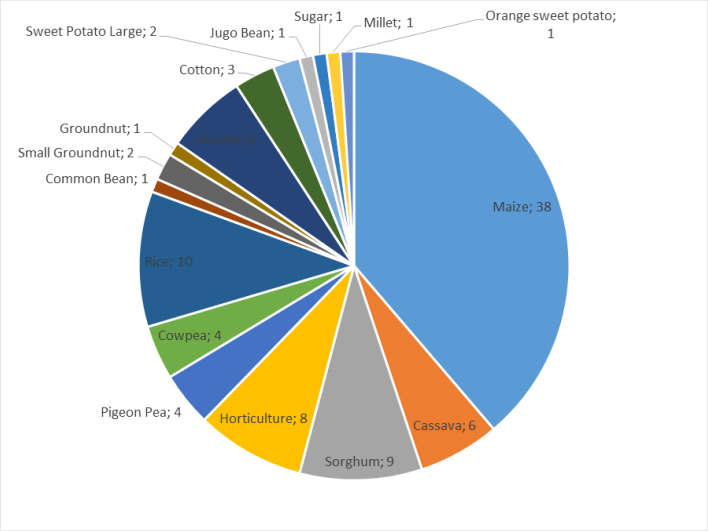


Figure 24: Farming land allocation according to crop type (%) in Sofala Province (Turner et al. 2013)



The survey of average land allocation informed a fixed effects regression[9] of the factors associated with crop diversification based on changes in land allocation for crops between 2008 and 2011 (Turner et al. 2013). The regression found that households in villages located more than 50 kilometres from a paved road grew less varied crops than those close to a paved road (Turner 2014). Conversely, amount of land owned and household size, an indicator of labour availability and heterogeneity of preferences, were positively associated with crop diversification (Turner 2014). It was also found that in scenarios of high food insecurity, farmers tend to focus their resources and energy on one crop only in order to ensure staple food supply (Turner 2014). The analysis suggests that poor, small-scale and isolated farmers lack access to markets, traders or extension services and information that may encourage greater crop diversification, as well as resources necessary for such diversification (Turner 2014).

Price was a found to be a strong determinant of crop diversification, except in the case of maize (Turner 2014). For other crops, farmers reported they would labour to produce individual crops that would either attract a high sale price or that would have been too expensive to purchase on the market. As such, price stabilisation and improved market access could encourage smallholders to diversify their production if they could plan production accordingly and access markets to sell their crops (Turner 2014).

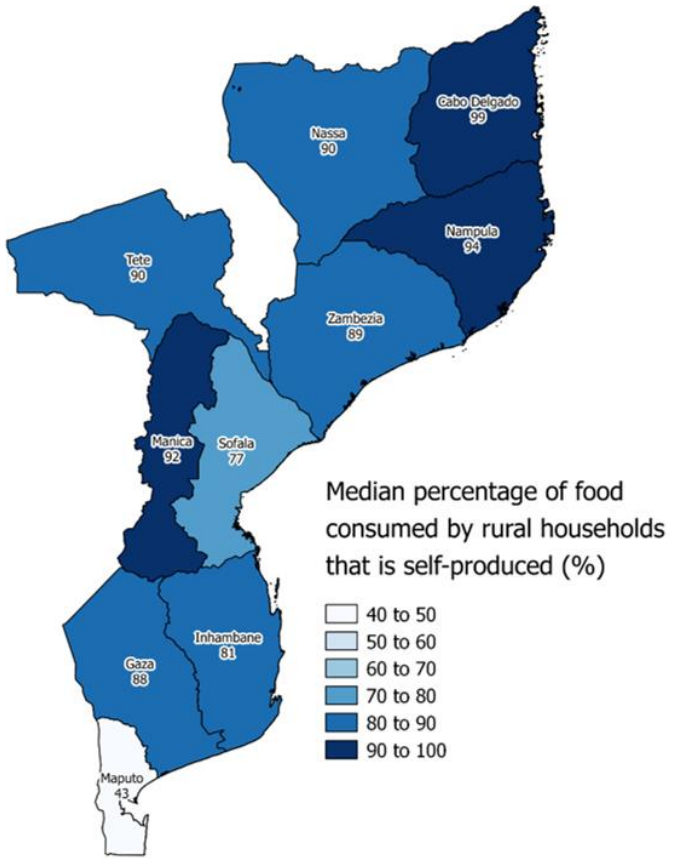
These findings support a similar finding that low farmer connectivity has contributed to preventing Mozambique's agricultural potential from being realized (The World Bank 2016). Maize productivity was 20% higher in districts where transport was affordable (less than US$2 per tonne) than in more isolated districts, where transport costs exceeded US$20 per tonne (The World Bank 2016). Farmers in more isolated areas are also less likely to have access to important agricultural inputs, such as fertilizer. While it is not possible to establish a causal link, the results suggest that long distances to markets act as a disincentive for farmers to increase

[9] Robust standard errors clustered by household

production since the associated input and transport costs would outweigh any additional revenue from increased production (The World Bank 2016).

Rural households in Mozambique are largely dependent on self-production for food. 90% of food consumed by rural households was from their own production, as per an analysis of the 2015 IOF household survey data (Ministerio de Economia e Finanças 2016) This figure was highest in Cabo Delgado where the median rural household self-produces 99% of their own food (Figure 25).

Figure 25: Median percentage of food produced by rural households themselves, by province (Ministerio de Economia e Finanças 2016)



CotD Modelling: Biofortified crops compared to non-biofortified crops

The introduction of and transition to biofortified crops is an intervention type that is increasingly being prioritised in Mozambique as a response to the low availability of micronutrient-rich foods, the dominance of starchy staple foods in both production and consumption and high levels of micronutrient deficiencies, such as severe levels of anaemia throughout the country and high levels of vitamin A deficiency among children.

NGOs, government initiatives and private funders are promoting orange-fleshed sweet potato (OFSP) with an improved vitamin A content as a nutritionally superior staple crop in Mozambique (Jenkins et al. 2015). A literature review of 20 studies of OFSP interventions in Mozambique found that its introduction into communities can dramatically increase vitamin A

intake among children (Jenkins et al. 2015). Further, OFSP has been found to be highly acceptable across Mozambique both in terms of sensory and agronomic characteristics (Jenkins et al. 2015).

To a smaller degree, some Mozambique FNG stakeholders are involved in interventions to develop and promote cassava varieties with improved vitamin A content and beans with improved iron content.

To estimate the potential impact of introducing biofortified crops on the cost of a nutritious household diet in Mozambique, CotD intervention modelling was carried out. The analysis considered that, as a result of home production, the diet for each member of the model household[10] could include up to one portion per day of biofortified OFSP, cassava and beans[11] (Table 2 and Appendix Table 7). This intervention was compared to the same portions of traditional, non-biofortified varieties of these crops. In both cases, as home-production was assumed, these portions were available for modelling at zero cost. On average[12] biofortified crops could reduce the cost of the diet compared to a diet with non-biofortified crops by 13% in rural areas and 7% in urban areas (Figure 26).

Table 2: Commodities modelled comparing home production of biofortified crops to non-biofortified crops (CotD Analysis 2017)

Commodity	Quantity (g)		Frequency	Modality
Biofortified crops compared to non-biofortified crops				
Cassava	Child 12-23 months	41	Daily	Own production
	Child 6-7 years	82		
	Adolescent girl 14-15 years	164		
	Lactating woman	288		
	Adult man	247		
Sweet potato	Child 12-23 months	41	Daily	Own production
	Child 6-7 years	82		
	Adolescent girl 14-15 years	164		
	Lactating woman	288		

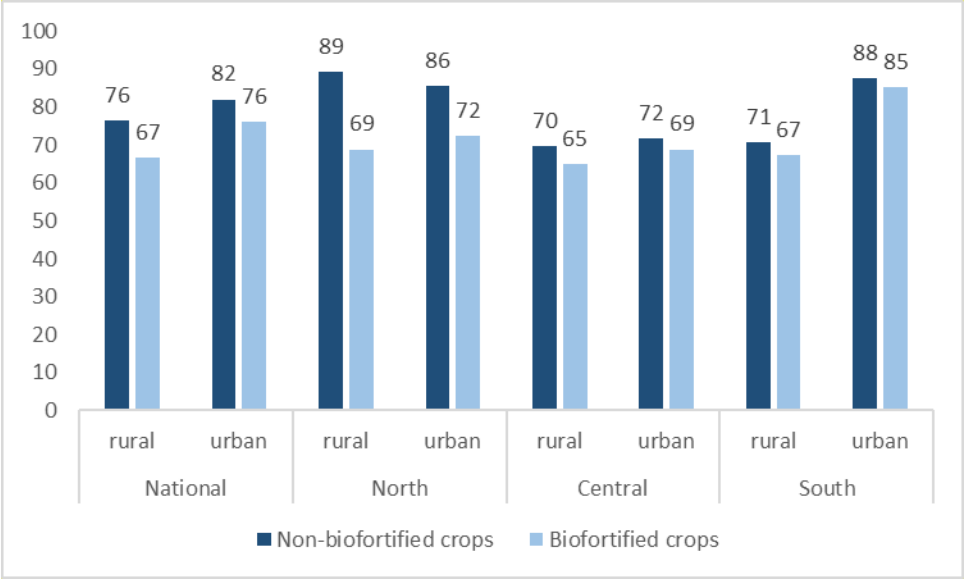
[10] See the section of household size and composition in the methods section (page 11)

[11] Estimated household yields required to provide a maximum of one portion per day per household member were 20 kg per month of OFSP, 20 kg per month of biofortified cassava and 5 kg of biofortified beans.

[12] Based on a weighted average of all provinces.

	Adult man	247		
Bean	Child 12-23 months	33	Daily	Own production
	Child 6-7 years	66		
	Adolescent girl 14-15 years	132		
	Lactating woman	230		
	Adult man	197		

Figure 26: Average[13] household cost of a nutritious diet compared to home production of biofortified foods (CotD Analysis 2017)



CotD Modelling: Reduction in post-harvest losses

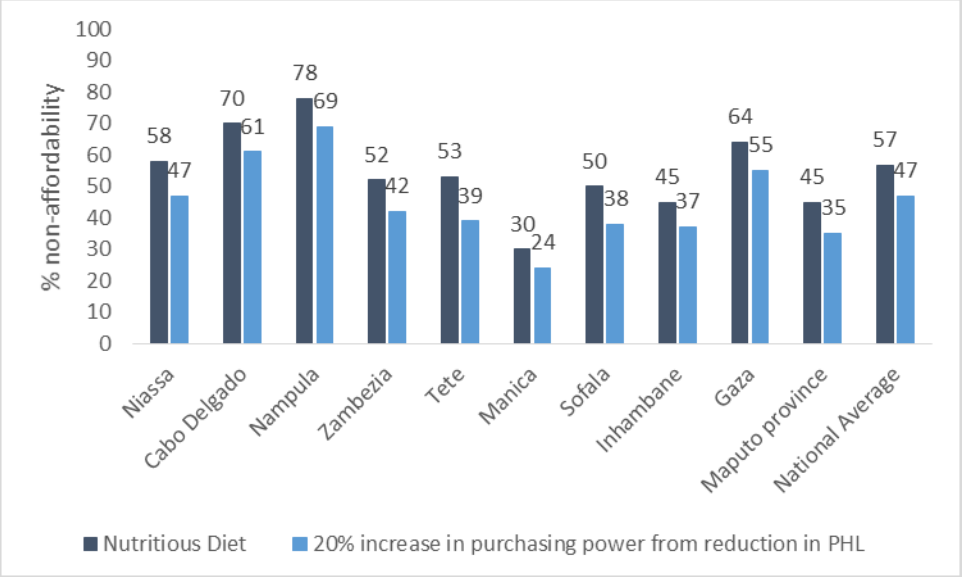
An estimated 30% of all production is lost in the post-harvest period due to poor handling practices and inadequate storage facilities (FAO 2011a). CotD modelling was carried out to estimate the effect of a reduction in post-harvest losses on the ability of households to afford a nutritious diet. The percentage of households that would not be able to afford a nutritious diet was estimated by applying an additional 20% to the monthly food budget (based on current expenditure). This 20% figure was based on a 90% reduction in post-harvest losses (from 30% to 3%, resulting in a 27% increase of production), with the assumption that 75% of the new, increased income (75% of 27% production increase) could be spent on food purchases. This analysis was conducted for rural households in all provinces, given that 90% of all rural household heads are engaged primarily in agriculture (The World Bank 2016).

[13] Weighted averages based on 2017 census projections (Instituto Nacional de Estadística 2007)

Based on food consumption expenditure in the IOF 2015 survey, 57% of rural households nationwide would be unable to afford a nutritious diet. With a 20% increase in purchasing power from a 90% reduction in post-harvest losses, the percentage of households unable to afford a nutritious diet would drop to 47% (Figure 27). As such, a reduction in post-harvest losses could increase the percentage of households able to access nutritious diets.

It should be noted that a reduction in post-harvest losses may not necessarily lead to a proportional increase in household income. An analysis of secondary data[14] found the use of improved granaries for maize storage did not always increase overall household incomes due to poor market access for sale (Cunguara & Darnhofer 2011).

Figure 27: Potential impact of a 90% reduction in post-harvest losses on the non-affordability of a nutritious diet for households in rural areas, by province



Key Message 3: Diets are dependent on unfortified staple foods and low in nutrient-rich foods. Household dietary diversity and consumption vary geographically.

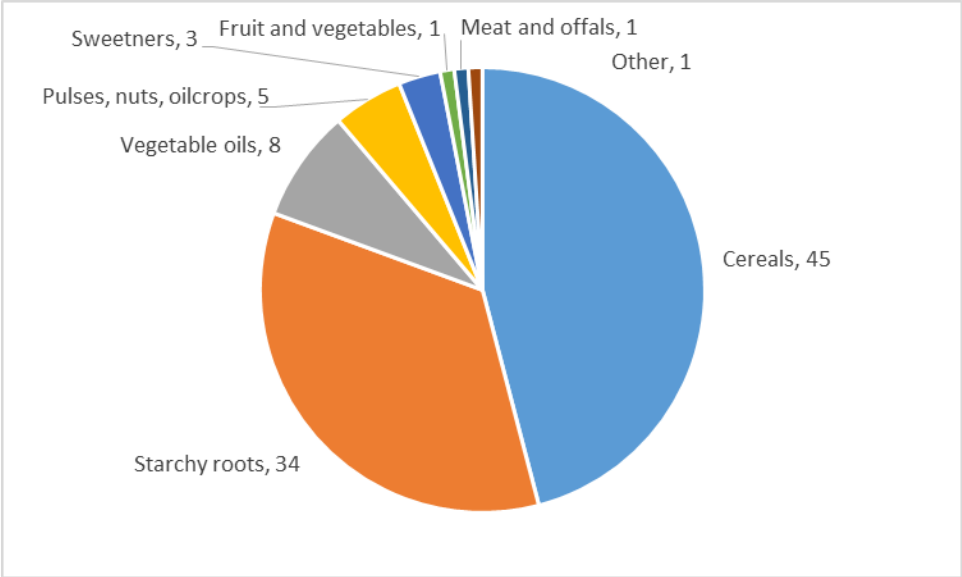
Dietary diversity and content

The most recently available nationally representative survey of dietary intake revealed very low dietary diversity and high staple dependency (FAO 2011b). As shown in Figure 28, cereals and starchy roots provide almost 80% of the dietary energy supply (FAO 2011b). Diets are mainly composed of cassava in the North and maize in the Centre and South (FAO 2011b). Consumption of foods rich in protein and micronutrients is poor, with the exception of green leafy vegetables accompanying staples (FAO 2011b). Diets of urban households are composed

[14] The evaluation was based on econometric analysis of a nationally representative rural household survey from 2005 using a doubly robust estimator, sub-classification and regression and matching and regression (n=353 improved granary users and 1395 non-users).

mostly of maize and imported wheat and have an increasing tendency to include street foods, snacks and sugar-rich foods (FAO 2011b).

Figure 28: Source of dietary energy (%) by food group, National Average Mozambique 2011 (FAO 2011b)



All foods that were reportedly consumed by at least 5% of households in a given assessment area (urban or rural within a province) in the 2015 IOF[15] were included as inputs for CotD analysis. The variety of foods consumed by more than 5% of households was low, especially in the North and Centre parts of the country, indicating very low diversity of available foods (**Error! Reference source not found.**).

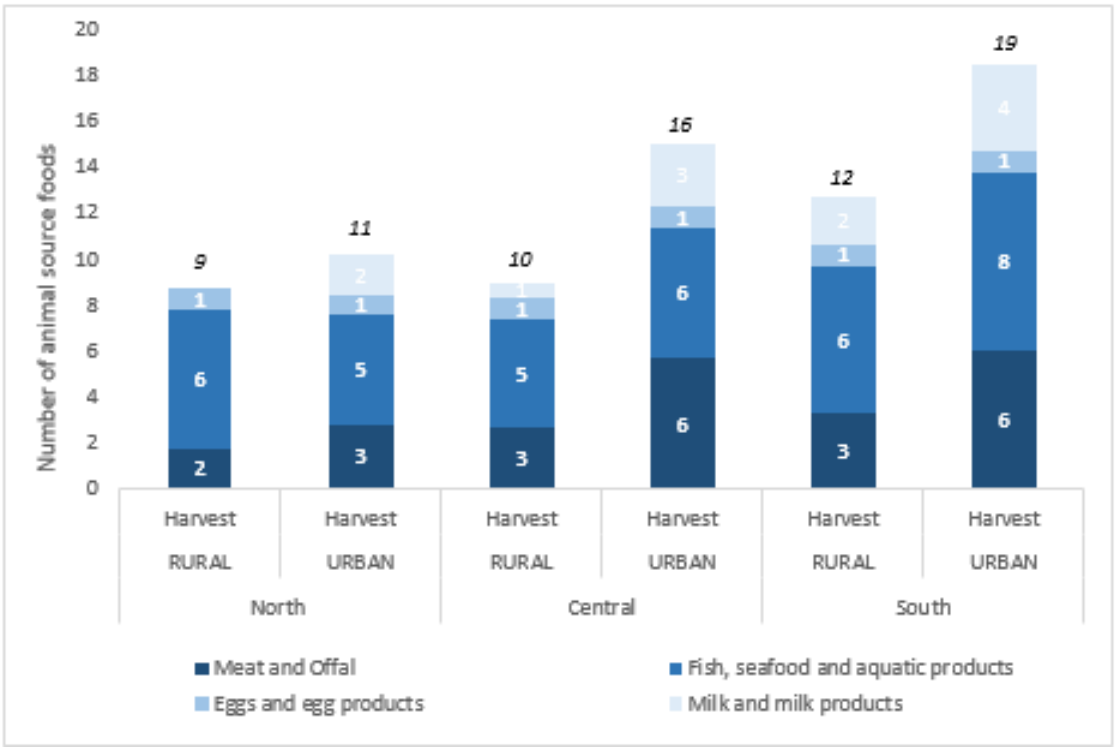
Consumption of animal source foods

The consumption data in the 2015 IOF are suggestive of poor general dietary diversity and poor access to a variety of foods within food groups. On average only 2 distinct foods from the 'meat and offal' food group were consumed by at least 5% of households in the North, 3 in the Centre and 4 in the South (Figure 29). The number of different vegetable products consumed in the North was more than double the number consumed in the South. The full food list with prices for urban and rural areas in each province is included in (Appendix Table 2: IOF 2015 food prices for Cost of the Diet analysis (N/A = food was not available during survey period) (Ministerio de Economia e Finanças 2016)).

A dairy industry is virtually non-existent in Mozambique due to unfavourable agro-ecological conditions, poor infrastructure and the effects of civil war (Johnson et al. 2013). Dairy products were not consumed in the North, 1 dairy product was consumed in the centre (condensed milk) and 3 imported dairy products were consumed in the South (fresh milk, powdered milk and condensed milk) (Ministerio de Economia e Finanças 2016).

[15] The 2015 IOF included 11,000 households throughout Mozambique who were surveyed three times from August 2014-August 2015 (Ministerio de Economia e Finanças 2016).

Figure 29: Number of animal source foods reportedly consumed by at least 5% of households in the 2015 IOF (Ministerio de Economia e Finanças 2016)



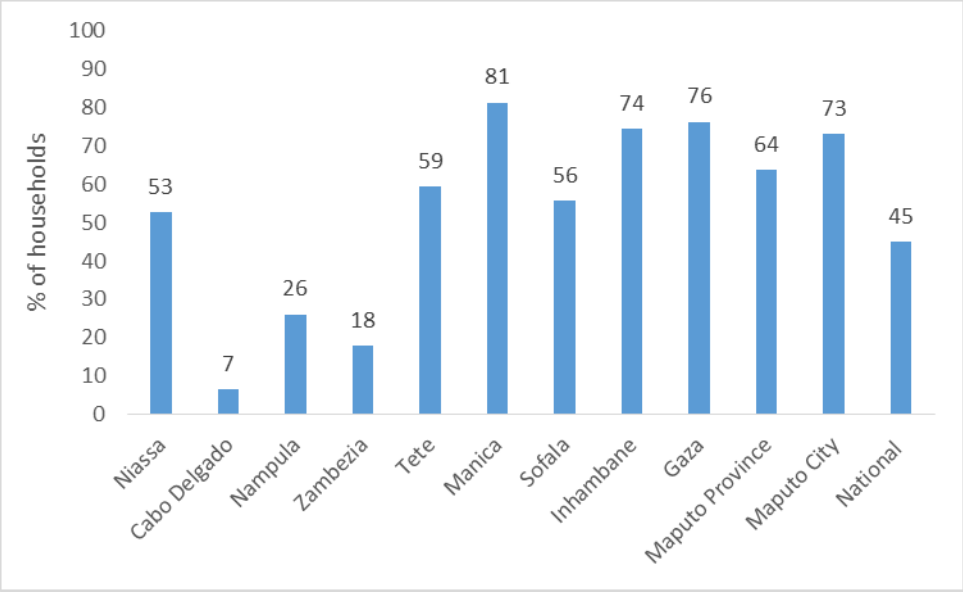
Due to many challenges in dairy production Mozambique's output was lower in 2006 (68,800 tons) than it was at the beginning of the civil war in 1980 (71,500 tons) (Johnson et al. 2013). To develop capacity for dairy production smallholder farmers would need improved veterinary services and water access to provide each cow with 80-100L per day and would then need to face a long supply chain that requires stable electricity at milk collection centres (Johnson et al. 2013). Few of the cattle breeds commonly raised in Mozambique are dairy breeds and the country almost entirely relies on imported milk from South Africa and Europe, resulting in high prices for consumers (Johnson et al. 2013). The average Mozambican consumes 5.7 litres of milk annually, down to 63% from 9.1 litres in 1990 and less than 10% of the world average of 79 litres (Johnson et al. 2013).

Food Fortification

Mandatory fortification in Mozambique began with universal salt iodization in 2000. Salt production in Mozambique is estimated to be enough to meet demand for human consumption, animal consumption, industry use and some export and imported salt contributes only marginally to national supply (Jooste 2014). There are an estimated 300 salt producers in Mozambique; 8 are large and the remainder are mostly small- or medium- sized (Jooste 2014).

Many small producers operate without a license and use techniques such as spray-mixing that leads to a wide range of iodization levels, often below adequate (Jooste 2014). Larger producers are more likely to iodize at adequate levels but they are also more likely to export their product and most salt available on local markets is from small and medium producers (Jooste 2014). As a result, coverage and compliance of salt fortification varies throughout the country. In the 2011 DHS only 45% of household salt tested was iodized salt, with coverage ranging from 7% in Cabo Delgado to 81% in Manica (Figure 30) (Instituto Nacional de Estatística (INE) et al. 2013).

Figure 30: Percentage of households surveyed with salt as part of 2011 DHS who were in possession of adequately iodised salt (Instituto Nacional de Estatística (INE) et al. 2013)



Under the National Food Fortification Programme, the Mandatory Food Fortification Decree was approved on March 16, 2016 mandating by law the fortification of:

- Wheat flour (for bread) with Iron, Folic Acid, B complex vitamins and Zinc
- Vegetable oil with vitamin A
- Sugar with vitamins A and D
- Maize flour with Iron, Folic Acid, B complex vitamins and Zinc
- Salt Iodization.
- Compliance and enforcement of fortification have been challenges with room for improvement.

CotD Modelling: Staple Fortification

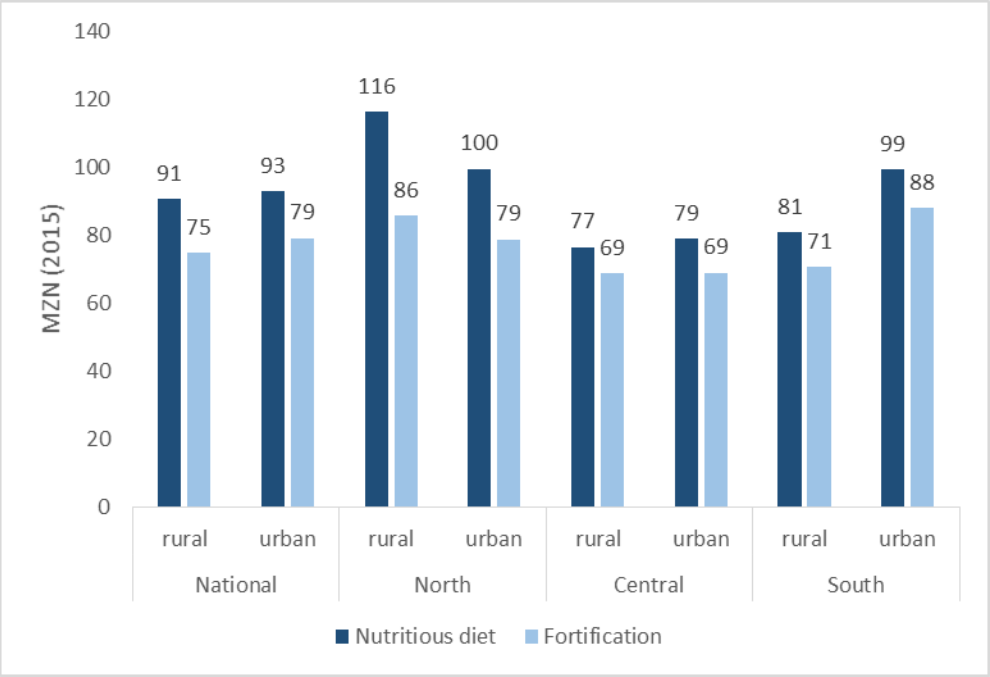
CotD intervention modelling was carried out to estimate the potential impact of food fortification on household ability to afford a nutritious diet. The modelling compared a diet that did not include fortified products with a diet that included fortified wheat flour, maize flour, vegetable oil and sugar with mandatory nutrient composition under the fortification decree . On

average mandatory fortification could reduce the daily cost of a nutritious diet for a five person model household by 17% in rural areas and 15% in urban areas% (Figure 31).

Table 3: Fortified commodities included in CotD intervention modelling (CotD Analysis 2017)

Commodity	Fortified with	Modality
Wheat flour	Iron, folate, B12 and zinc	Market
Maize flour	Iron, folate, B12, zinc	Market
Oil	Vitamin A	Market
Sugar	Vitamin A	Market

Figure 31: Average[16] household cost of a nutritious diet compared to fortified foods at minimum mandatory levels (CotD Analysis 2017)



[16] Weighted averages based on 2017 census projections (Instituto Nacional de Estadística 2007)

Key Message 4: Most households are subsistence farmers, producing staples for own consumption. Poverty and limited market access impact their ability to source a diverse diet.

Poverty trends and distribution

As per the 2014 IOF, 46% of Mozambicans are living under the national poverty line (a consumption-based poverty headcount using the PLEASe methodology), a 5 percentage point reduction from the 2008 IOF (Salvucci et al. 2017). These gains did not contribute to a convergence in welfare levels across urban and rural zones or by geographical region (Figure 32 and Figure 33) (Salvucci et al. 2017).

Figure 32: Trends in poverty headcount (percentage of population below national poverty line) in urban and rural areas of Mozambique from 1996-2014 (Salvucci et al. 2017)

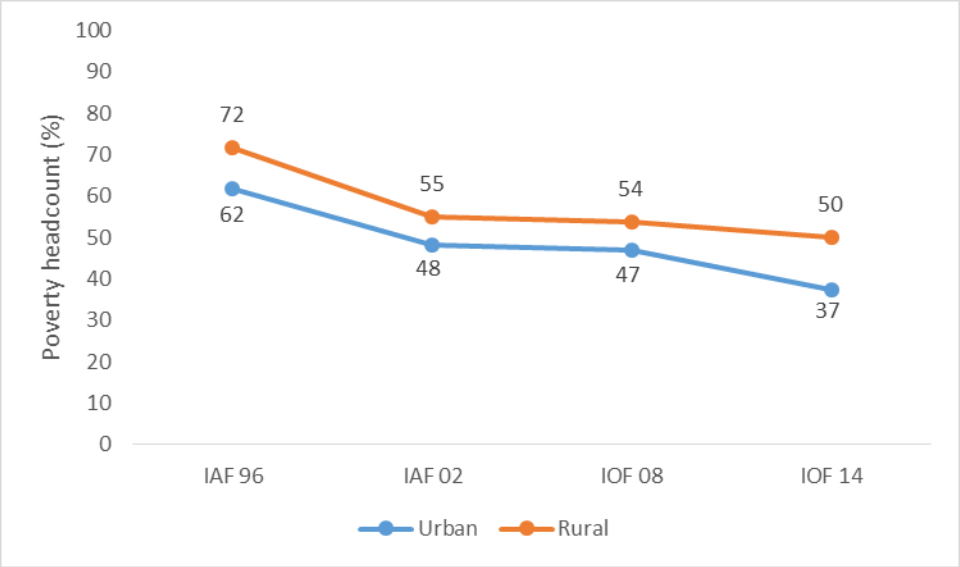
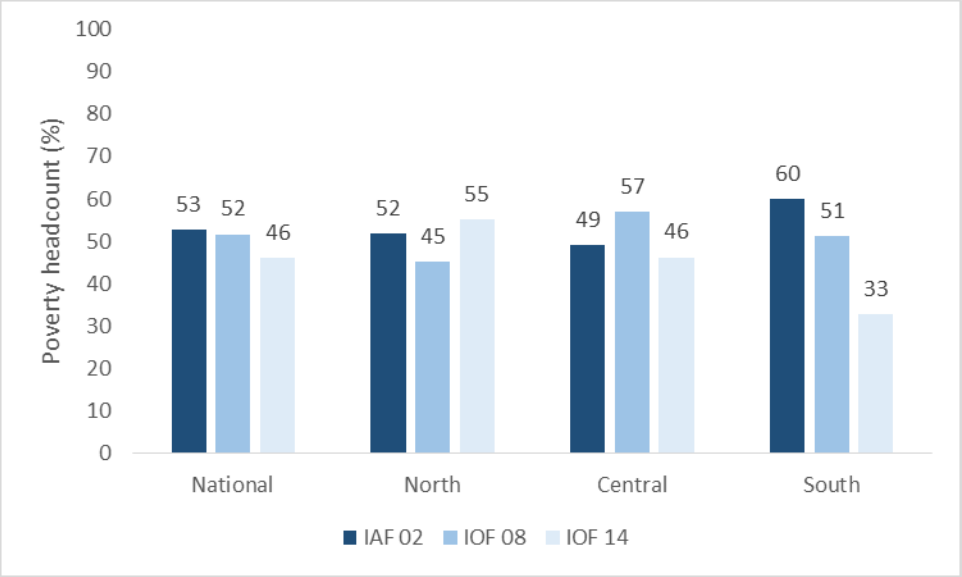
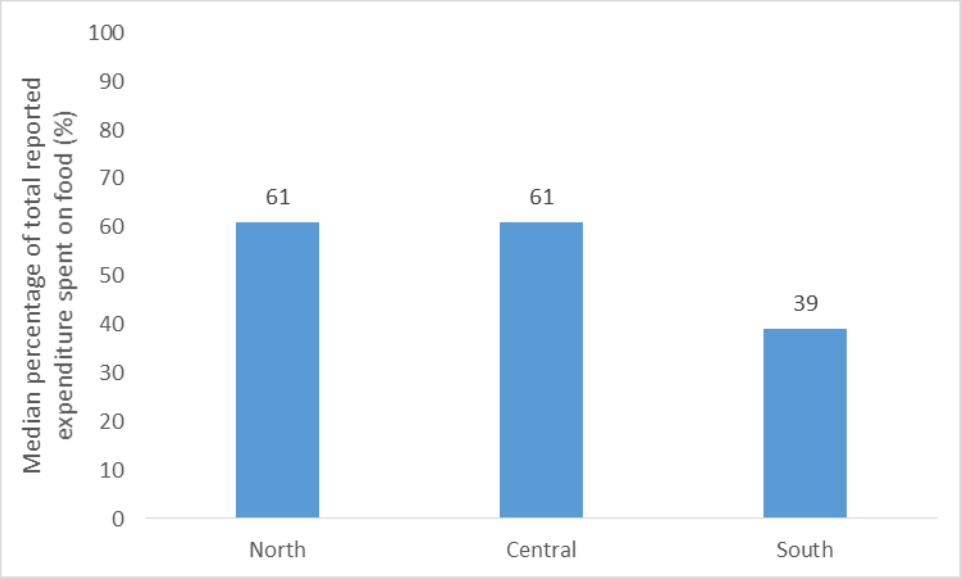


Figure 33: Poverty headcount (percentage of population below national poverty line) by region as per the 2014 IOF (Salvucci et al. 2017)



In the North and Centre the median percentage of total expenditure spent on food was 61% compared with 39% in the South, further suggesting that households in the South are better off economically than those in the North (Figure 34) (Ministerio de Economia e Finanças 2016).

Figure 34: Median percentage of total household expenditure spent on food (Ministerio de Economia e Finanças 2016).



Transport and Infrastructure

The most pressing infrastructure challenge in Mozambique is transport. Access to domestic markets for rural populations is extremely poor and the country lags behind others in the region (Dominguez-torres & Briceño-garmendia 2011). Based on GIS analysis, only 24% of the population lives within 2 km of any road (Dominguez-torres & Briceño-garmendia 2011).

Mozambique is a large country with sharp contrasts between the North, with a dispersed population in low plateaus and rugged highlands, and the South, with population clusters around major urban areas (Dominguez-torres & Briceño-garmendia 2011). Despite Mozambique's north-south geography most transport infrastructure is east-west connecting neighbouring countries to sea ports (Dominguez-torres & Briceño-garmendia 2011). Transport corridors link urban and economic centres to ports but not to each other (Figure 35) (Dominguez-torres & Briceño-garmendia 2011). As a result, producers in the agriculturally productive North are unable to transport their products to consumers in the less agriculturally productive but more economically developed South, where most food is imported from South Africa.

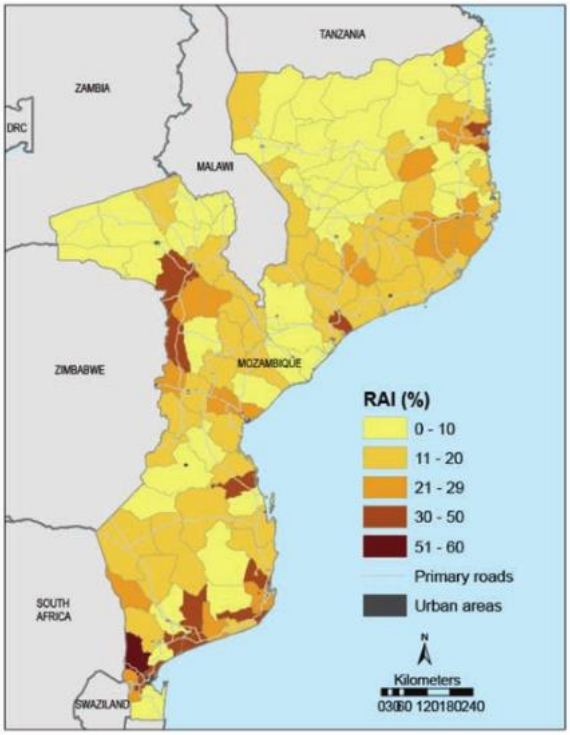
Figure 35: Map of major roads in Mozambique

Mozambique's road network of 3.7 km road density per 100 km^2 of land is much lower than the regional average of 13.2 km road density per 100 km^2 (The World Bank 2016). The World Bank's Rural Access Index (RAI) measures the proportion of people who have access to an all-season road within a walking distance of 2 km[17], a distance the World Bank cites as a reasonable threshold for economic and social purposes (World Bank Group 2016). Mozambique's RAI is estimated at 20.4%, indicating that four out of five Mozambicans do not have access to roads, a crucial factor for boosting agricultural growth and poverty reduction (World Bank Group 2016). In comparison, the RAI in Kenya is 58% (The World Bank 2016). RAI is below 50% in most districts throughout the country with the exception of districts in and around Maputo, a few

[17] Measurements are based on WorldPop population data and digitized road network data (World Bank Group 2016).

small districts along the coast and a few districts along the border with Zimbabwe (Figure 36) (World Bank Group 2016).

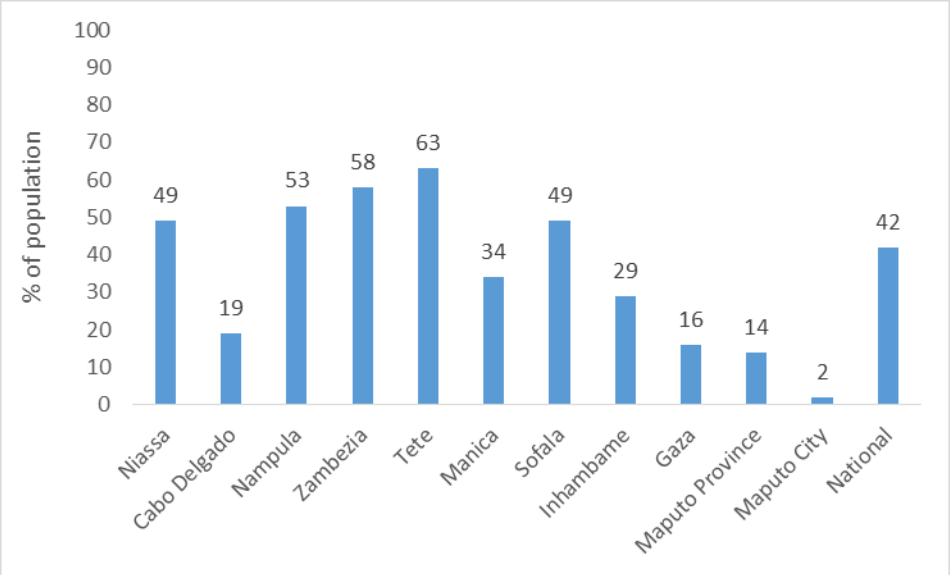
Figure 36: RAI by district (values range from 0-100 based on the percentage of people in rural areas who live within 2 km of a road) (World Bank Group 2016)



Market Access

RAI is significantly correlated with poverty and transport connectivity is particularly weak in Northern and inland provinces where poverty is highest (The World Bank 2016). RAI is also correlated with market access and in Centre Mozambique and Northern Mozambique 50% and 45% of the population, respectively, live more than 30 minutes walking access from the nearest market, which is defined as not having market access, compared with 25% of the population in the South. The percentage of the population without market access ranges from 63% of the population in Tete, 58% in Zambezia and 53% in Nampula to 2% in Maputo City, 14% in Maputo Province and 16% in Gaza (Figure 37) (Ministerio de Economia e Finanças 2016).

Figure 37: Percentage of population without market access (defined as living more than 30 minutes walking distance from the nearest market) (Ministerio de Economia e Finanças 2016)



Sale and Use of Production

With limited market access, farm land in Mozambique is used to cultivate staples for subsistence rather than cash crops and in 2012 only 22% of farmers sold any of their production; on average over 80% of production was retained for consumption within the household (The World Bank 2016). A 2011 survey of crop production patterns found that on average each household in Nampula, Zambezia, Tete, Manica and Sofala (the five provinces included in the survey) produced 4-5 crops in Nampula, Zambezia, Tete and Manica and 6 crops in Sofala (Table 4) (Turner 2014). A large number of households dependent on agriculture produce few subsistence crops and consume most of their production with little earnings to spend on other foods and as a result household dietary diversity in Mozambique is very very low. There is very little difference of crops grown among farmers and crops are mostly starch. Crop production (based on land allocation) is predominately maize in Tete, Manica and Sofala and maize and cassava in Nampula and Zambezia (Turner 2014).

Table 4: Average number of crops cultivated per household (Turner 2014)

	Average number of crops cultivated per household
Nampula	4.1
Zambezia	4.6
Tete	4.4
Manica	4.2
Sofala	6.0

Agricultural production is directly linked to market access in Mozambique. In remote areas households are likely to receive lower prices for crops and pay higher prices for inputs (The World Bank 2016). With inadequate storage facilities and low market access there is little incentive for many rural households to expand production and only 15% of total arable land in Mozambique is in use (Observatorio do Meio Rural 2015).

Key Message 5: Most people in Mozambique can afford food to meet their body's energy requirements, but more than half do not have economic access to a nutritious diet of locally available foods.

Cost of the Diet software was used to calculate the daily and monthly cost of diets that meet: 1) energy-only requirements and 2) staple-adjusted nutrient requirements for a model five person household (child 12-23 months of age; lactating woman; adolescent girl (14-15 years old); school aged child (6-7 years old); adult man). Food availability and price data came from the household consumption component (7-day recall) of the 2014-2015 Inquérito do Orçamento Familiar (IOF) Household Budget Survey capturing food production/ expenditure and consumption across the lean and plenty seasons (Ministerio de Economia e Finanças 2016).

The daily cost of the nutritious diet was more than four times the cost of the energy-only diet (Figure 38 and Figure 39). The national average of the daily cost of the energy-only diet was 21 MZN (2015) and the national average of the daily cost of the nutritious diet was 91 MZN (2015). For most of Mozambique there was little variation in the cost of the energy-only diet. The nutritious diet was most expensive in Cabo Delgado, Niassa and Tete, likely due to lower availability of nutritious foods.

Figure 38: Daily cost of a diet that meets energy needs for a model five person household by province (CotD Analysis 2017)

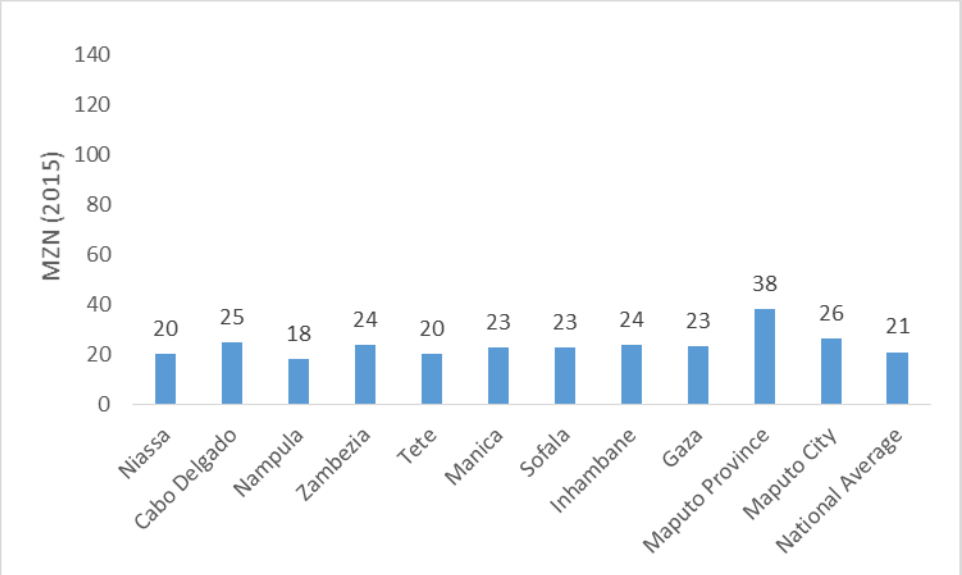
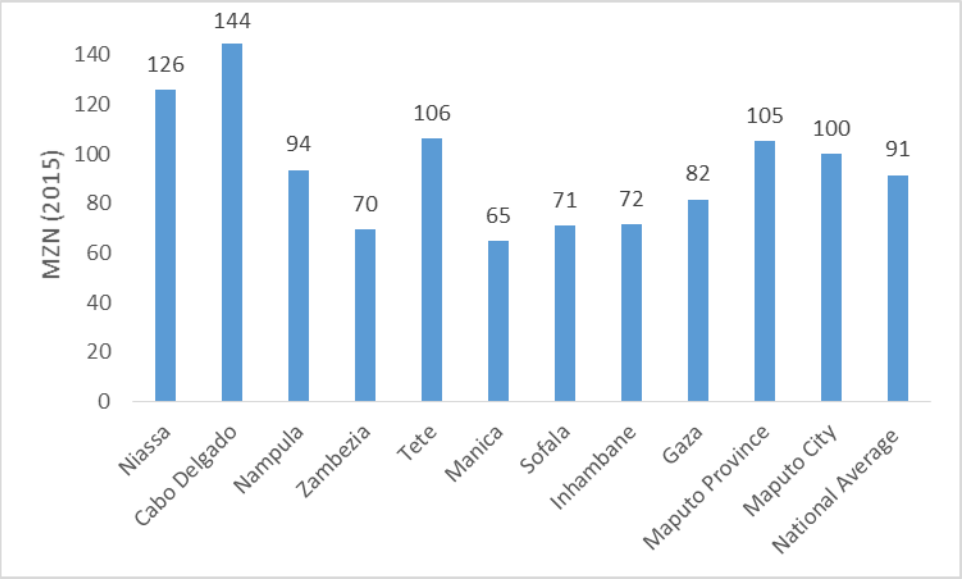


Figure 39: Daily cost of a staple-adjusted diet that meets nutrient needs for a model five person household by province (CotD Analysis 2017)



The cost of the energy only and nutritious diets were compared with the amount of money households reported spending on food in the 2015 IOF, including monetized own production, to estimate the percentage of households within the population that would not be able to realistically afford energy-only and nutritious diets.

The majority of families in Mozambique could afford an energy-only diet with 7% of households unable to purchase this diet (Figure 40). Non-affordability of the energy-only diet was highest in Zambezia (13%) and Gaza (13%). The majority of families in Mozambique could not afford a diet that meets nutrient needs with an estimated 54% of households nation-wide lacking access to a nutritious diet (Figure 41). The map of the percentage of households that cannot afford a nutritious diet is somewhat similar to the stunting prevalence map with highest non-affordability and highest stunting prevalence in the northern half of the country, particularly in Cabo Delgado and Nampula (Figure 42). Gaza and Manica are interesting outliers in opposite ways – Gaza has high non-affordability and lower stunting than the national average and Manica has low non-affordability and high stunting.

Figure 40: Percentage of households that cannot afford a diet that meets energy needs by province (CotD Analysis 2017)

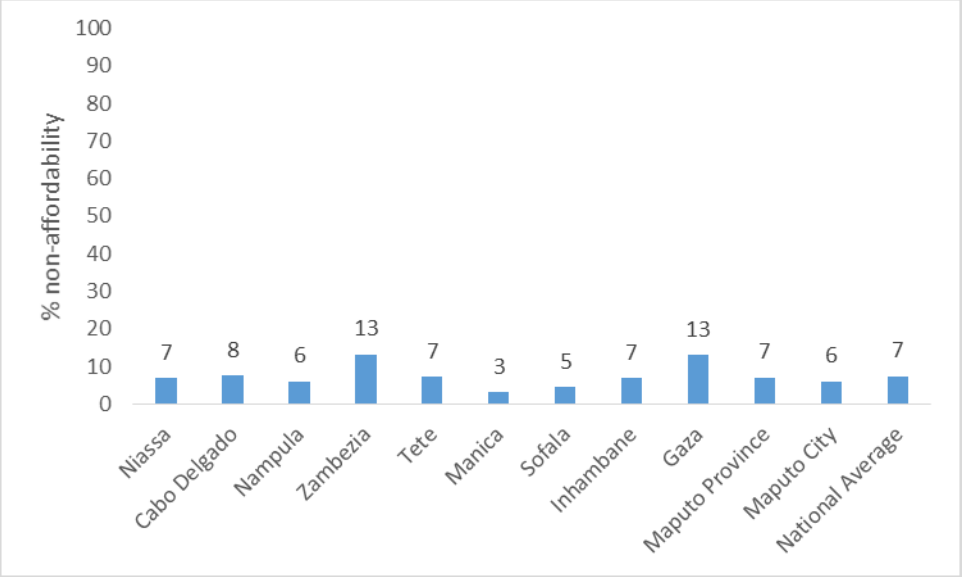
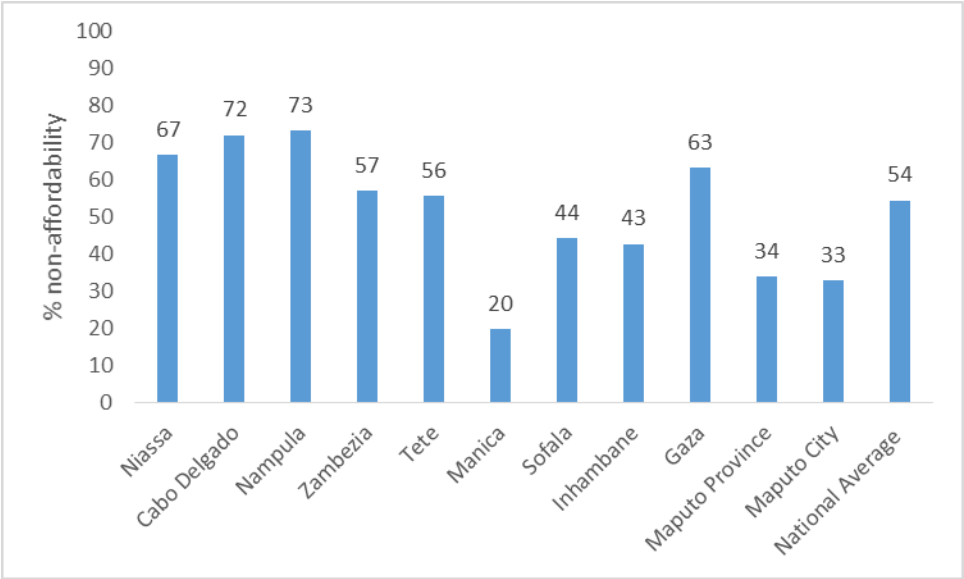


Figure 41: *Percentage of households that cannot afford a nutritious diet that meets nutrient needs by province (CotD Analysis 2017)*



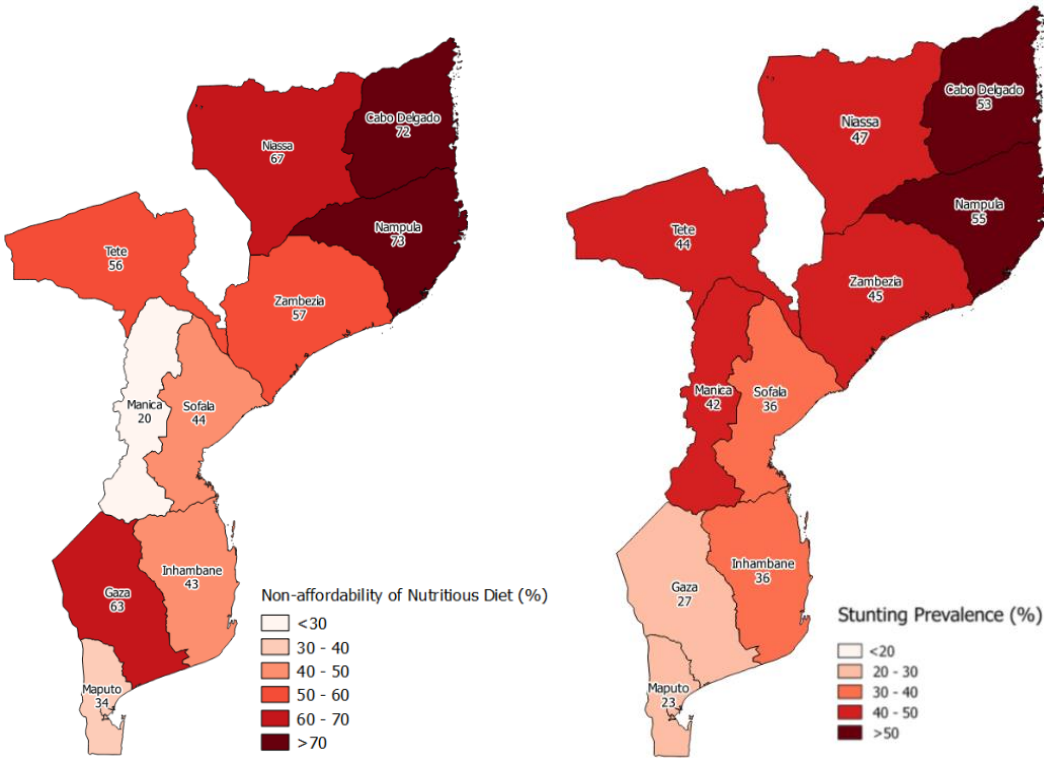


Figure 42: Percentage of households that cannot afford a nutritious diet and severity of Stunting by Province, as per the 2011 Mozambique DHS (Cost of the Diet Analysis 2017; Instituto Nacional de Estatística (INE) et al. 2013)

Three factors can influence the non-affordability of the nutritious diet: 1) foods available, 2) food prices and 3) food expenditure.

Food availability varies throughout the country with fewer different foods available in the North and Centre. In the IOF an average of 39 foods per province in the North and 42 food per province in the Centre were reportedly consumed by more than 5% of households, compared with 53 foods in the South. Specifically, fewer animal source foods were consumed in the North (Figure 29). This suggests that availability could be a driver of non-affordability, because if more foods were available there would be more options the software could select from for households to meet nutrient needs with local foods and the cost of the nutritious diet would be lower.

Food prices directly impact the cost of the nutritious diet. A comparison of three foods available in all areas provides a sense of food price variation. Tomatoes are cheapest in the Centre and in the rural North, slightly more expensive in the urban north and much more expensive in the South (Figure 43). Eggs and maize prices are roughly the same in the North and Centre and much more expensive in the South, particularly in the urban South (Figure 44 and Figure 45). In the North and Centre households produce these three foods and in the South they are mostly imported from South Africa.

*Figure 43: Average reported price per 100g of **Tomatoes** by region and area as per the 2015 IOF*

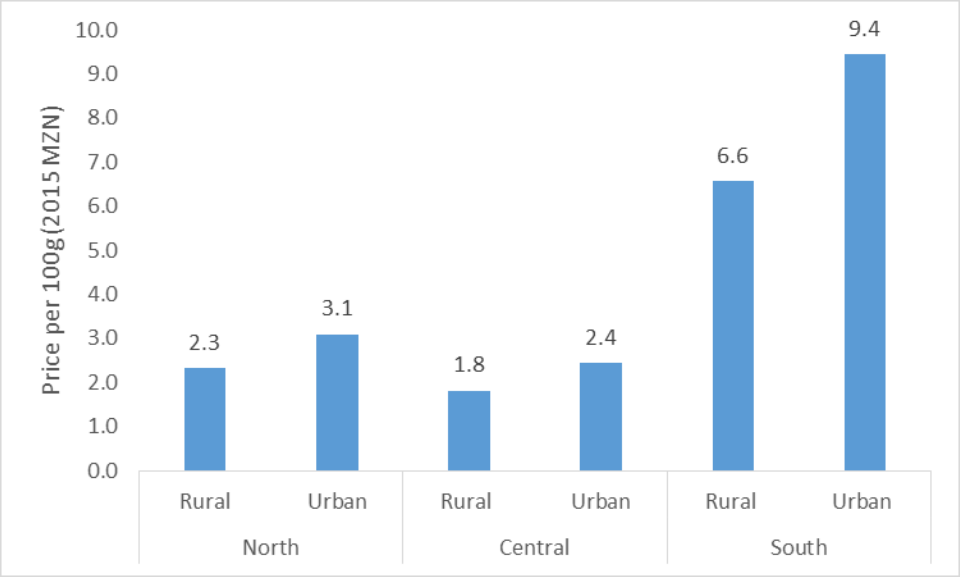


*Figure 44: Average reported price per 100g of **Eggs** by region and area as per the 2015 IOF*

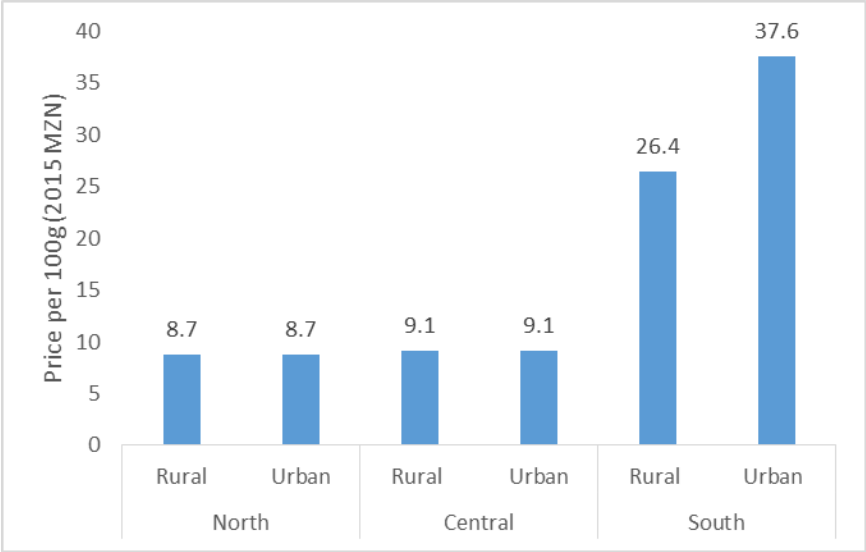
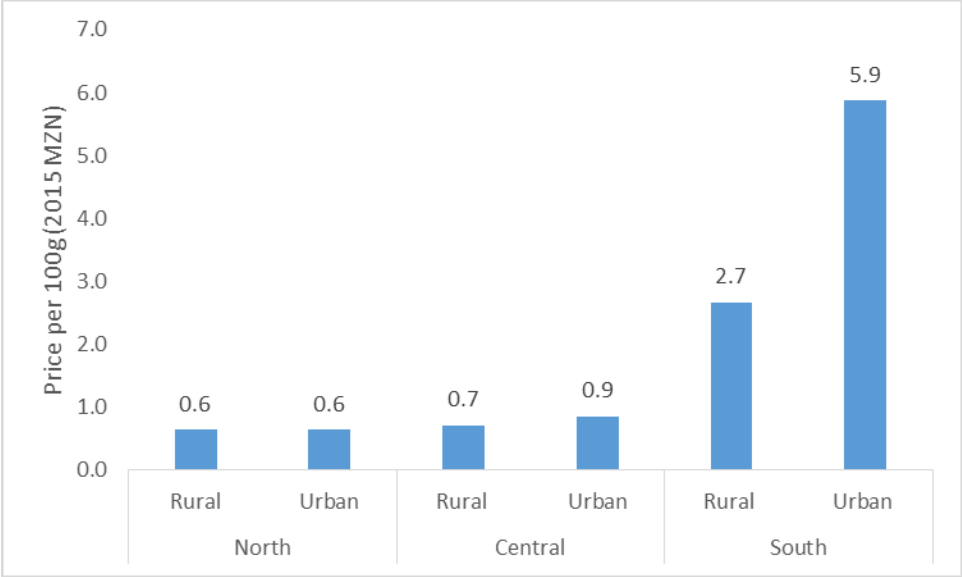


*Figure 45: Average reported price per 100g of **Maize** by region and area as per the 2015 IOF*



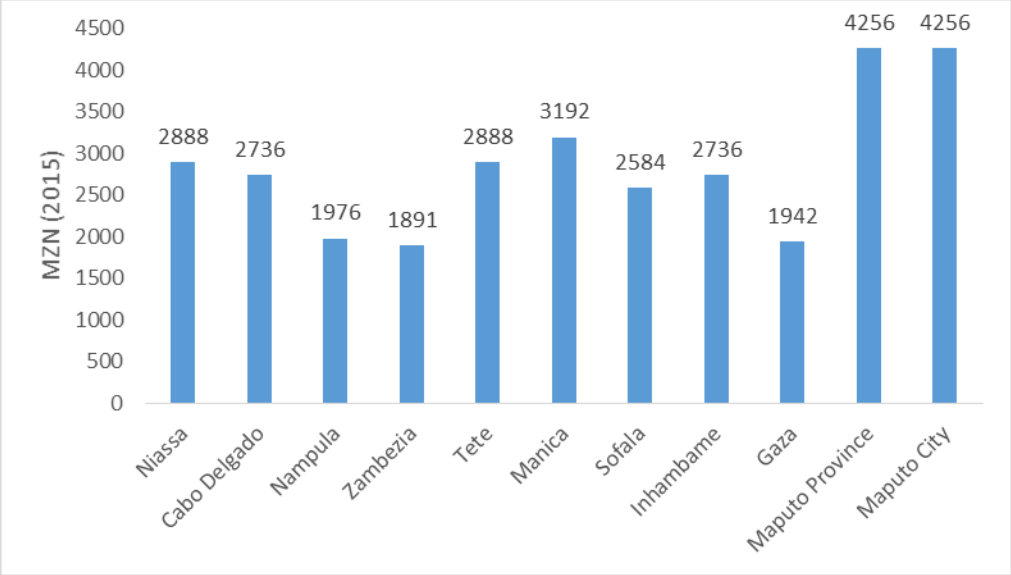
A third determinant of the non-affordability of a staple-adjusted nutritious diet is the amount households spend on food. The IOF 2015 data for per capita median food expenditure (including monetized income of consumed foods self-produced by agricultural households) was adjusted to estimate monthly food expenditure for a five person household.[18] By province the median monthly household food expenditure was lowest in Zambezia, Gaza and Nampula. The median monthly household food expenditure in Maputo Province and Maputo City was more than double that of these three provinces (Figure 46). Low food expenditure is related to few income

[18] Based on daily per capita food expenditure in IOF 2015 multiplied by 5 people per household and 30.4 days per month.

earning opportunities and low levels of connectivity (i.e. very limited road access, discussed above) have likely contributed to low returns to labour and land in Zambezia and Nampula where households have considerably lower average yearly farm and non-farm income (The World Bank 2016) (Figure 47).

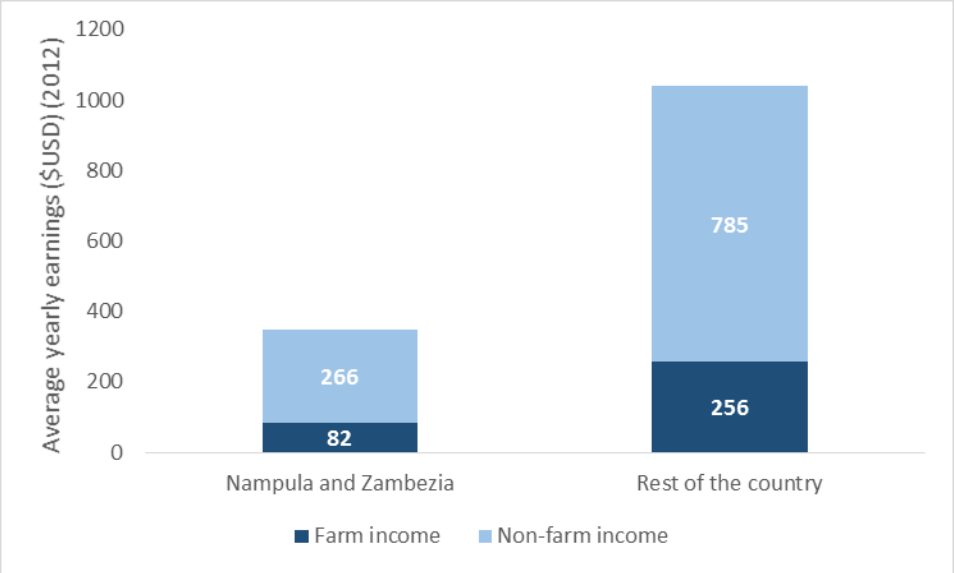
In the South there are more non-farm opportunities and an analysis of a subsample from the 2008 National Agricultural Household Survey of 1,196 households in Inhambane, Gaza and Maputo found that 58%[19] of households in these three provinces were engaged in at least one non-farm income generating activity (Cunguara et al. 2011). The most common category of non-farm work was what researchers classified as high return self-employment with 26% of respondents engaged in activities, such as home-made beverage production, livestock trade, agro-processing and milling (Cunguara et al. 2011). 11% of households were engaged in unskilled agricultural work on small or large farms and 11% of households were engaged in what researchers classified as low return extraction of flora and fauna products, such as collecting firewood, grass, palm leaves and honey or hunting (Cunguara et al. 2011). 10% of households were engaged in unskilled non-agricultural wage income, such as domestic work and 10% of households were engaged in skilled or specialized non-agricultural work, such as teaching, managing, government work and mining (Cunguara et al. 2011).

Figure 46: Average monthly consumption on food for a five person household by province (based on daily per capita food expenditure) (Ministerio de Economia e Finanças 2016)



[19] Similar estimates were not available for other provinces

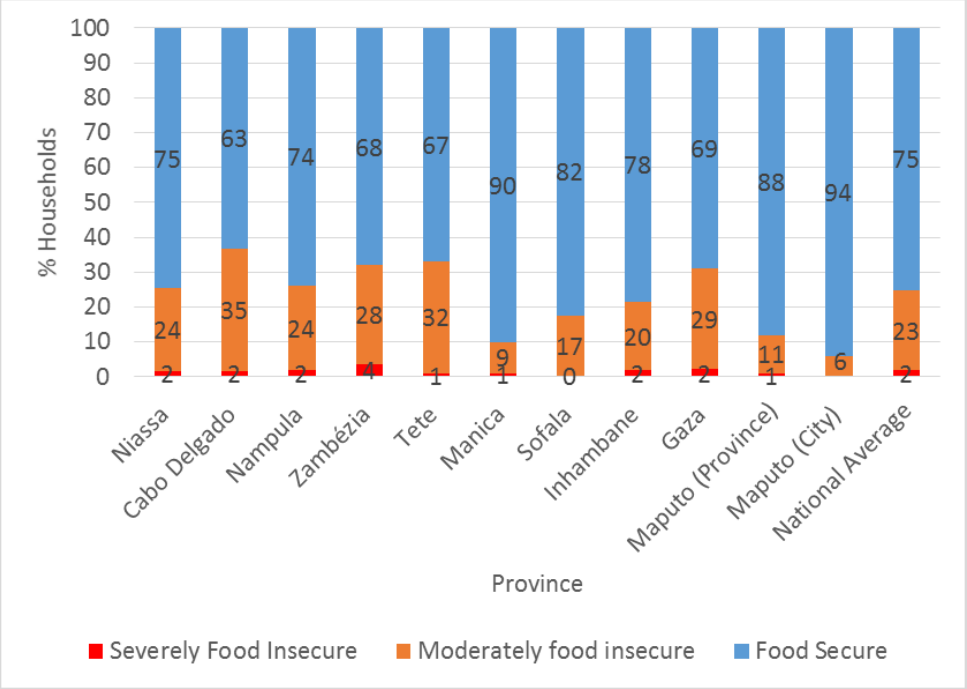
Figure 47: Average yearly earnings from farm and non-farm activities for households in Nampula and Zambezia compared with the rest of Mozambique (The World Bank 2016).



Key Message 6: Seasonal fluctuations, climate shocks and economic shocks regularly threaten food security, dietary diversity and nutrition.

SETSAN has developed a Food Security Index (FSI) based on food consumption scores, the length of time households experience difficulties, the expected duration of cereal stocks between harvests , income sources and the severity of coping strategies (SETSAN 2014). In the most recent food security and nutrition situation analysis, 25% of households were determined to be food insecure overall; 23% of households with moderate food insecurity and 2% with severe food insecurity (Figure 48) (SETSAN 2014). Food insecurity was higher in rural areas; 27% of rural households were moderately food insecure compared to 14% in urban areas and 2% of rural households were severely food insecure compared to 1% in urban areas (SETSAN 2014). Food insecurity was highest in Cabo Delgado, Tete, Zambezia and Gaza provinces (SETSAN 2014).

Figure 48: Household Food security status as determined by SETSAN's Food Security Index for the 2013 SAN Baseline (SETSAN 2014)



In a typical year, the lean season is experienced in the North of Mozambique from December to March and in the South and Centre regions from October to February (Figure 49) (FEWSNET 2013). To capture trends across seasons the IOF was conducted over four different time periods of three months each, incorporating harvest and lean seasons. A secondary analysis of IOF data for the FNG did not reveal clear differences in patterns of expenditure (including monetized for self-produced crops) between the plenty and lean seasons. There was however clear variation in the number of foods reportedly consumed in the different seasons. The FNG analysis identified foods reportedly consumed during each season by more than 5% of households in urban and rural areas across the North, Centre and South. The average number of foods consumed was

lower during the lean season (Figure 50) largely due to lower reported consumption of vegetables (Figure 51).

Figure 49: Seasonal Calendar for North and South/Central Mozambique (FEWSNET 2013)

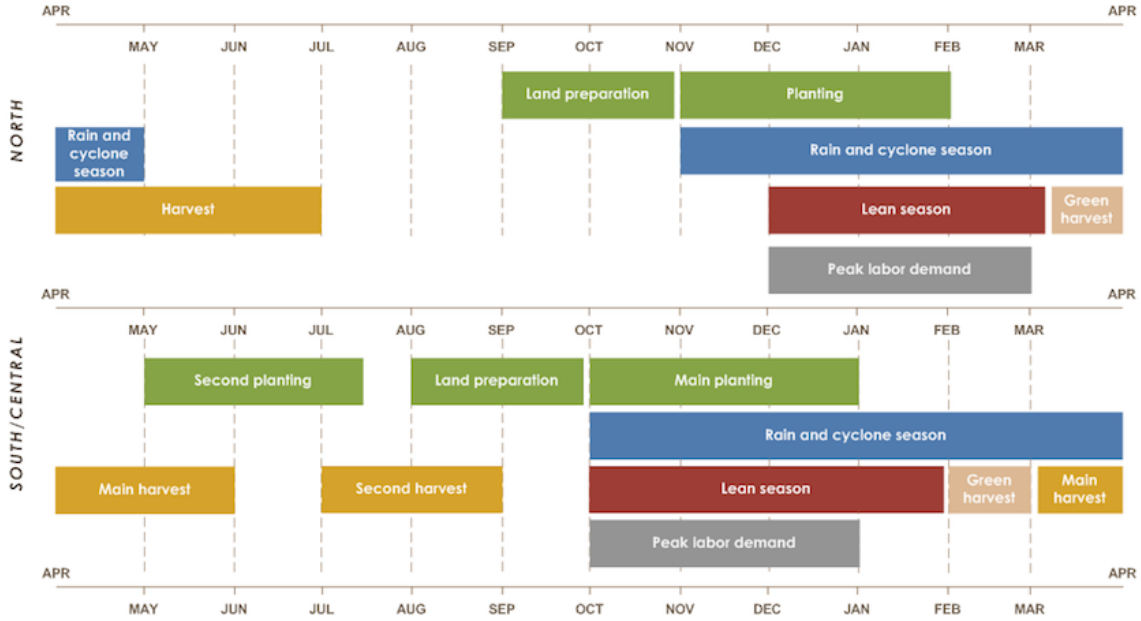


Figure 50: Average number of foods reportedly consumed by >5% of households in rural and urban Mozambique by region (Ministerio de Economia e Finanças 2016)

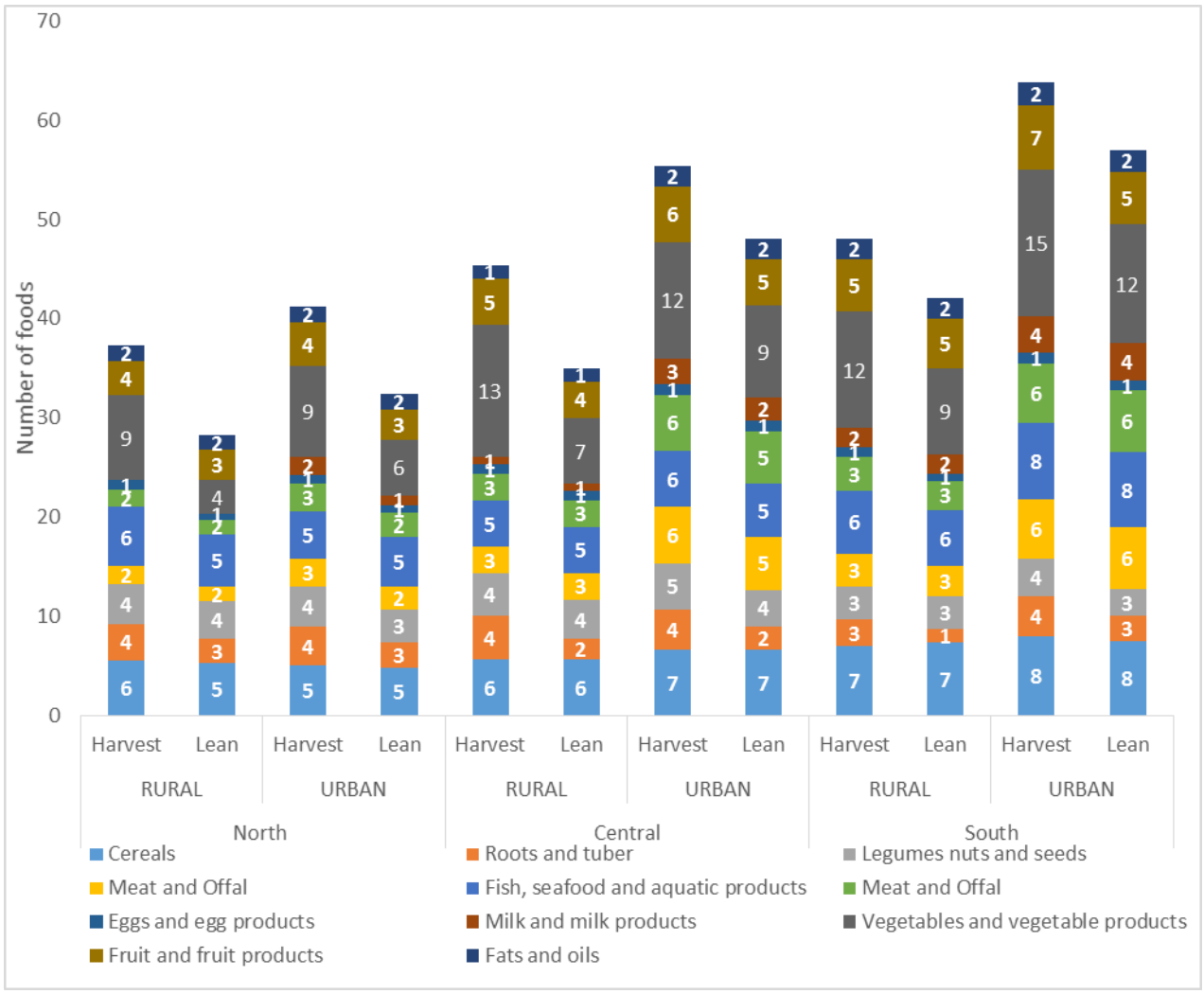
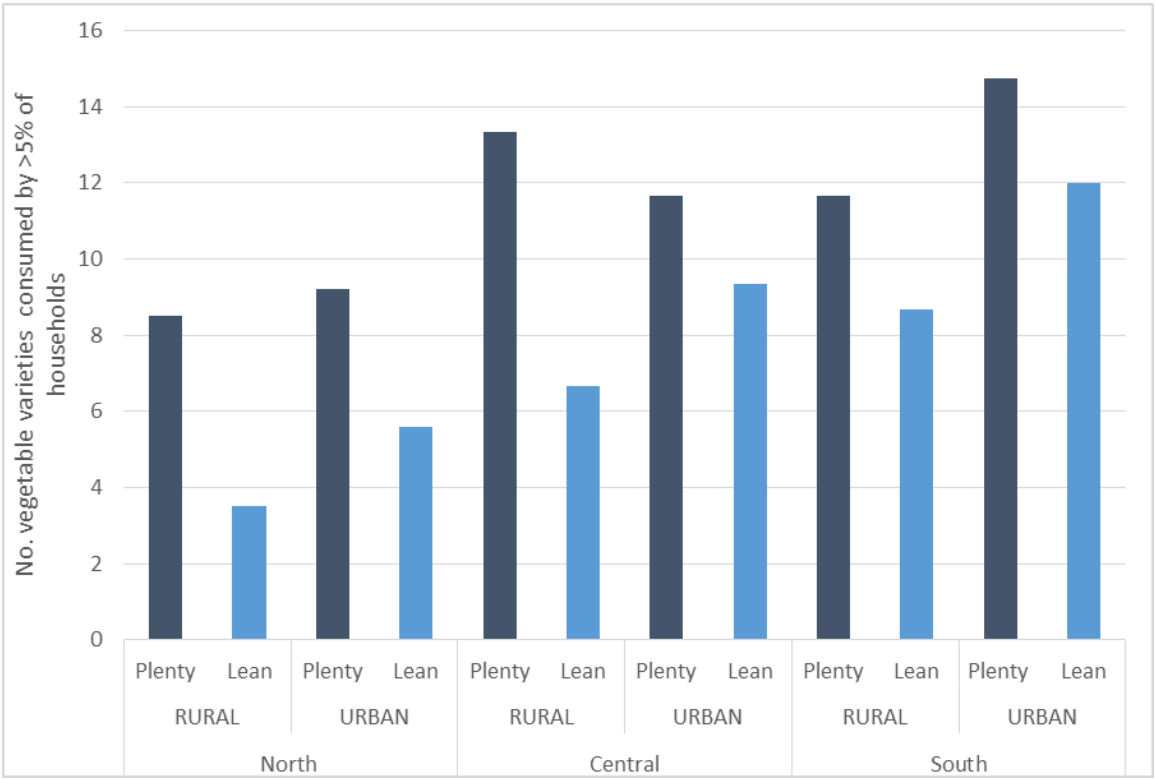
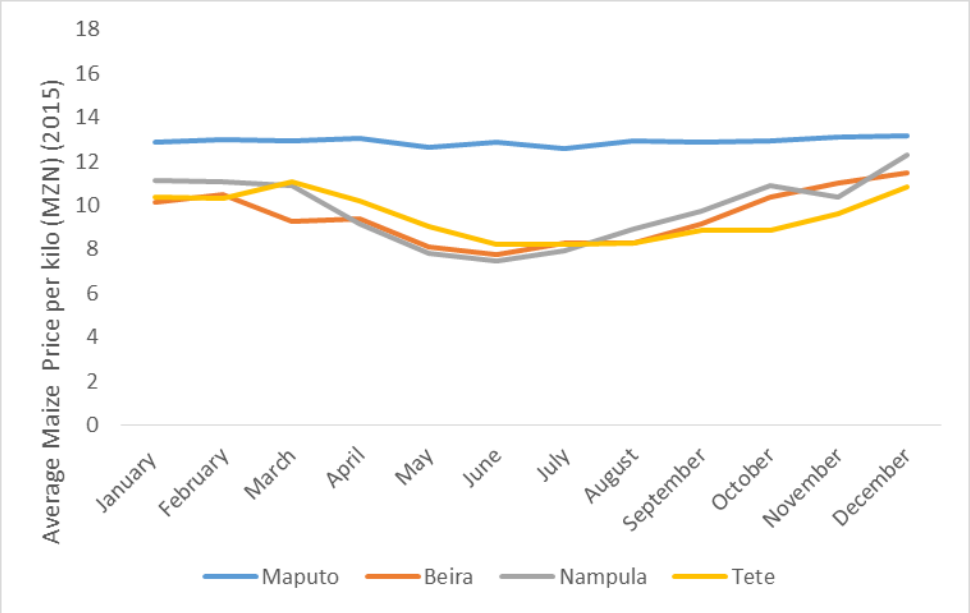


Figure 51: Average number of different vegetable varieties reportedly consumed by >5% of households in rural and urban areas by region



As shown in Figure 52, the timing of the lean season and the associated decrease in the variety of food available, corresponded with maize price spikes in Beira, Nampula and Tete between 2011-2015(World Food Programme 2017a). In Maputo, where much of the food is imported from South Africa, maize was more expensive but there was little fluctuation in price throughout the same period (World Food Programme 2017a).

Figure 52: Average monthly price per kilo for maize, 2011-2015, in Maputo, Beira, Nampula and Tete provinces



The financial crisis of 2015, which caused rampant inflation and rapid depreciation of the Metical, led to an increase in maize prices throughout Mozambique, Maputo included, that lasted until early 2017 (Figure 53). At peak inflation, the Consumer Price Index (CPI) increased by 60% between December 2010 to December 2016 (Figure 54) (Instituto Nacional de Estadística 2017). High inflation is a threat to nutrition in Mozambique and analysis[20] of the 2008 IOF across four time periods with a focus on estimating the effect of the 2008 global financial crisis found that wasting was higher when inflation peaked due to poverty and high food prices, with a greater vulnerability in rural areas (Arndt et al. 2016). This finding suggests that wasting prevalence during the 2016-2017 period could have climbed above the levels reported in the 2011 DHS. Because dietary quality decreases before quantity, micronutrient deficiencies that are related to dietary quality are likely to have increased further during this period as well.

[20] Arndt et al. used propensity score matching to compare households surveyed during periods of high inflation with households surveyed during periods of low inflation (Arndt et al. 2016).

Figure 53: Average annual price per kilo (MZN) of Maize in Maputo, Beira, Nampula and Tete, 2011-2017 (World Food Programme 2017a)

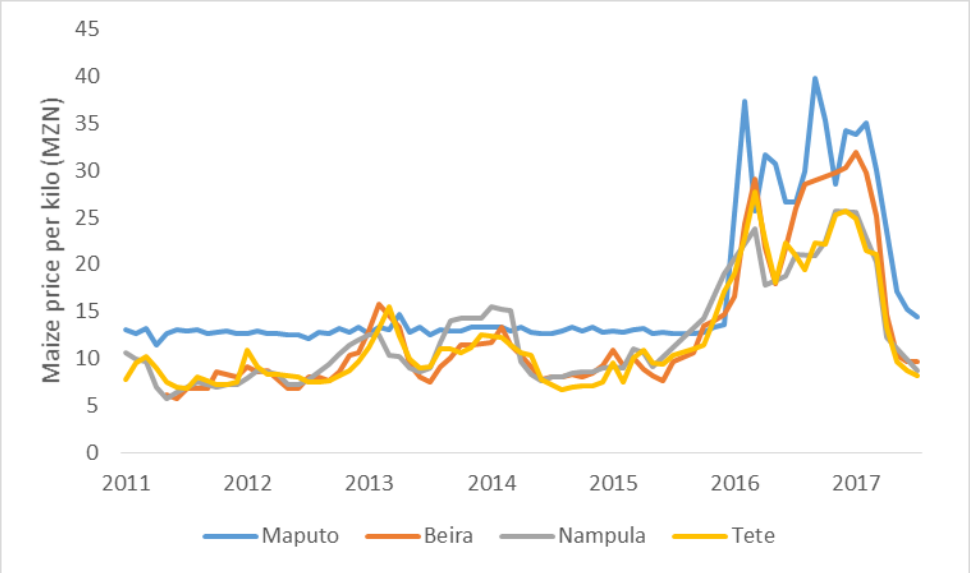
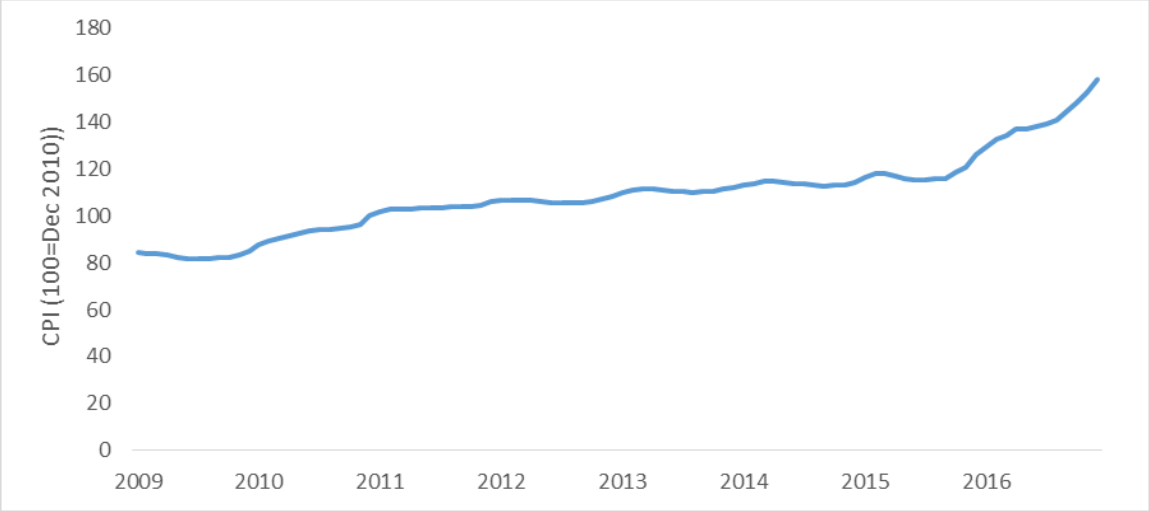
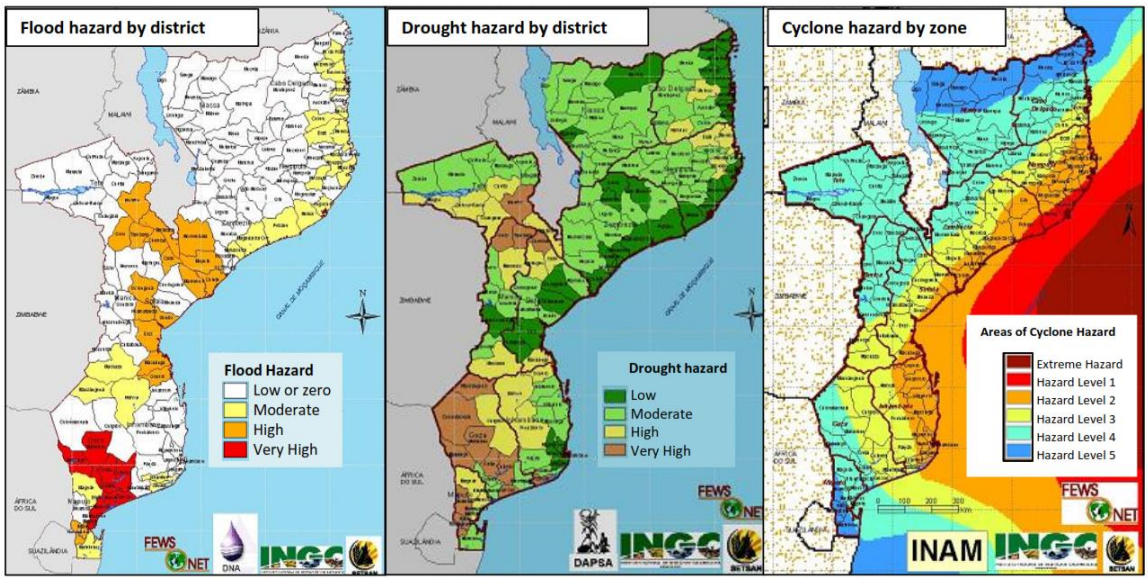


Figure 54: Consumer Price Index (CPI) Mozambique 2009-2016 (December 2010=100) (Instituto Nacional de Estadística 2017)



Along with inflation, climate change poses a serious risk to nutrition in Mozambique. An evaluation by German Watch, a think tank and research organization, found that Mozambique was the country most severely affected by climatic events in the world (Kreft et al. 2017). An estimated 48% of the population is exposed to either drought or flood and, with nearly 2500 km of coastline, much of the country is exposed to the threat of cyclones (Figure 55) (DRFI 2012). Flooding poses a very high threat in the South and a high threat in the Centre. Drought is a very high hazard in the South and in Tete, Manica and Sofala particularly around the border where the three provinces meet. Cyclones are a particular hazard along the coast from Inhambane to Nampula.

Figure 55: Severity of flood, drought and cyclone hazards in Mozambique by district (DRFI 2012)



During the drought caused by El Nino in 2015-2016 WFP estimated that roughly 1.5 million people (~5% of the total population) in Mozambique were food insecure (Caccavale et al. 2016). During this time the harvest failed in most of the South and in many parts of Central Mozambique (Caccavale et al. 2016). WFP estimated that fixing the shortfall would require a 26% increase in maize import capacity, a challenge given regional production constraints due to similar droughts, the state of the national economy following the economic crisis and Mozambique's limited storage and transport capacity (Caccavale et al. 2016). Internal trade within Mozambique is difficult. Crops from the North are not easily transported to the South due to limited north/south infrastructure and increasing attacks on truck convoys in Sofala, Zambezia and Tete (Caccavale et al. 2016).

CotD Modelling Food Assistance for Assets (FFA)

WFP's FFA initiative responds to droughts, floods and cyclones by providing assistance to families experiencing acute food shortages. Recent operations have taken place in Zambezia, Tete and Gaza. To estimate the potential impact of different current and potential FFA programs on the cost of nutritious diets, intervention modelling using CotD was conducted for the scenarios described in Table 5.

Scenarios 1, 2, 3 and 4 represent in-kind transfers. Scenario 5 would involve vendors travelling to communities to set up temporary market places to sell the four commodities listed. In this scenario, beneficiaries would be able to select the quantity of each commodity to the total value on a cash card.

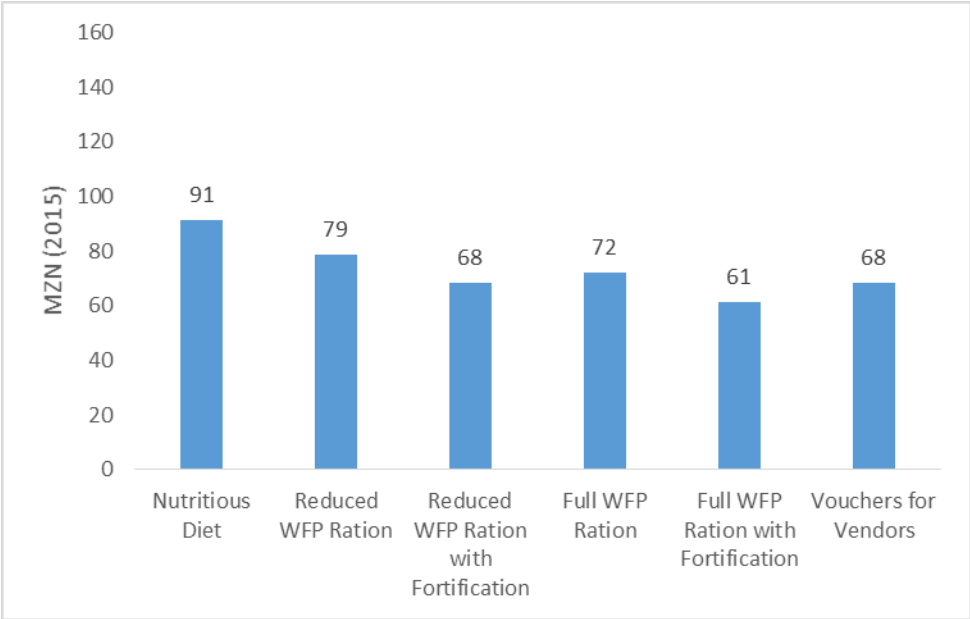
Table 5: Alternative FFA intervention scenarios modeled using the CotD analysis

Commodity	Quantity	Frequency	Modality
Scenario 1: Reduced WFP ration			
Maize flour	9310 g	Weekly	In-kind
Kidney Bean	1400 g	Weekly	
Scenario 2: Reduced WFP ration with fortified flour			
Maize flour (Fortified)	9310 g	Weekly	In-kind
Kidney Bean	1400 g	Weekly	
Scenario 3: Full WFP Ration			
Maize flour	14000 g	Weekly	In-kind
Kidney Bean	2100 g	Weekly	
Vegetable Oil	875 g	Weekly	
Scenario 4: Full WFP ration, with fortified flour and oil			
Maize flour (Fortified)	14000 g	Weekly	In-kind
Kidney Bean	2100 g	Weekly	
Vegetable Oil (Fortified)	875 g	Weekly	
Scenario 5: Cash based transfer implemented through food vouchers			
Maize flour	10500 g	Weekly	Cash cards to purchase four commodities
Kidney Bean	5250 g	Weekly	
Vegetable Oil	875 g	Weekly	
Sugar	875 g	Weekly	

Intervention modelling showed that each of the interventions could reduce the daily cost of a nutritious household diet (Figure 56). On average[21] the half ration (scenario 1) reduced cost by 14% and the fortified half ration (scenario 2) reduced cost by 25% (Figure 56). The full ration (scenario 3) reduced cost by 21% and the fortified full ration (scenario 4) reduced cost by 33%. Vouchers for vendors (scenario 5) reduced cost by 25%. The cost of the nutritious diets estimated for the models shown here are limited by the fact that they are based on the most recently available food price and availability data from the 2015 IOF. In the instance of a shock, food availability may be less and prices could increase.

[21] National weighted average of all provinces

Figure 56: Average[22] household cost of a nutritious diet compared to five different food for assets scenarios (CotD Analysis 2017)

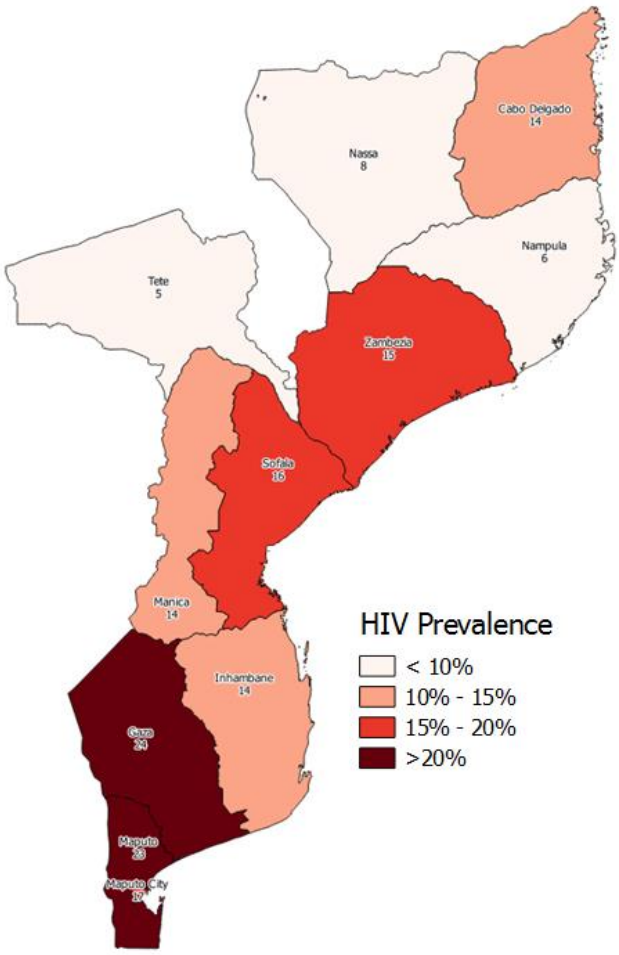


Threats to household income and food security as a result of HIV infection

Mozambique is one of eight countries in the world with an HIV prevalence above 10% (Central Intelligence Agency 2017). Between 2009 and 2015 the prevalence in men and women aged 15-49 increased by 15%; from 11.5% to 13.2% (Instituto Nacional de Saúde (INS) & Instituto Nacional de Estatística (INE) 2015; ICF Macro & Instituto Nacional de Estatistica Mozambique 2010). HIV prevalence varies geographically and is highest in the South, close to the borders of South Africa and Swaziland (Figure 57). HIV prevalence is higher amongst women (15.4%) than men (10.1%) and there is a greater burden in urban areas (16.8%) than rural areas (11%) (Instituto Nacional de Saúde (INS) & Instituto Nacional de Estatística (INE) 2015).

[22] National weighted average of all provinces

Figure 57: Adult HIV Prevalence by province, 2015 (Instituto Nacional de Saúde (INS) & Instituto Nacional de Estatística (INE) 2015)



Across the spectrum of HIV infection, HIV disease and AIDS, nutritional status is affected by infections and diseases that pose challenges for the intake and utilization of nutritious foods, increasing caloric requirements, reducing appetite and affecting the ability to absorb nutrients. Simultaneously, HIV can impact access to nutritious diets for the entire household by reducing income opportunities for those infected as well as the family members who spend time caring for them and by reducing education and income opportunities for the next generation (FAO 2002).

The Mozambique FNG analysis does not include CotD modelling related to HIV due to the complexity of estimating the nutritional impact of HIV on someone living with the disease and the economic impact of the disease on the household. International guidelines on the nutritional requirements for those living with HIV have not kept pace with changes in treatment and the effect of anti-retroviral medications on nutritional requirements and the ability to absorb nutrients (WHO 2003). There is no estimation in the literature of the economic impact of HIV infection for households with people living with HIV in Mozambique. Without the ability to carry out specific CotD modelling, this analysis acknowledges that HIV is a challenge to nutrition

in Mozambique that, as well as causing a substantial social burden would likely further impact the ability of households to access a nutritious diet.

Individual dietary intake and practices

Key Message 7: Continued breastfeeding rates are high but nutrient intake from complementary food is low. Targeted interventions can improve nutrient intake of children aged 6-23 months.

Breastfeeding practices and beliefs

The median duration of exclusive breastfeeding in Mozambique was 1.3 months in the 2011 DHS, much lower than the recommended six months (Instituto Nacional de Estatística (INE) et al. 2013). Rates of exclusive breastfeeding varied considerably by province from 65% in Niassa to 13% in Tete (Figure 58**Error! Reference source not found.**) (SETSAN 2014). 43%[23] of children aged 0-5 months were breastfed exclusively; 87% of children 12-17 months and 61% of children 18-23 months were still fed breastmilk demonstrating a decrease in continued breastfeeding rates between 12 months of age and 24 months (Figure 59).

[23] Based on asking what was done in the previous 24 hours

Figure 58: Percentage of children who were breastfed exclusively (between 0 and 5 months of age) by province, area and national average, Mozambique 2011 (SETSAN 2014)

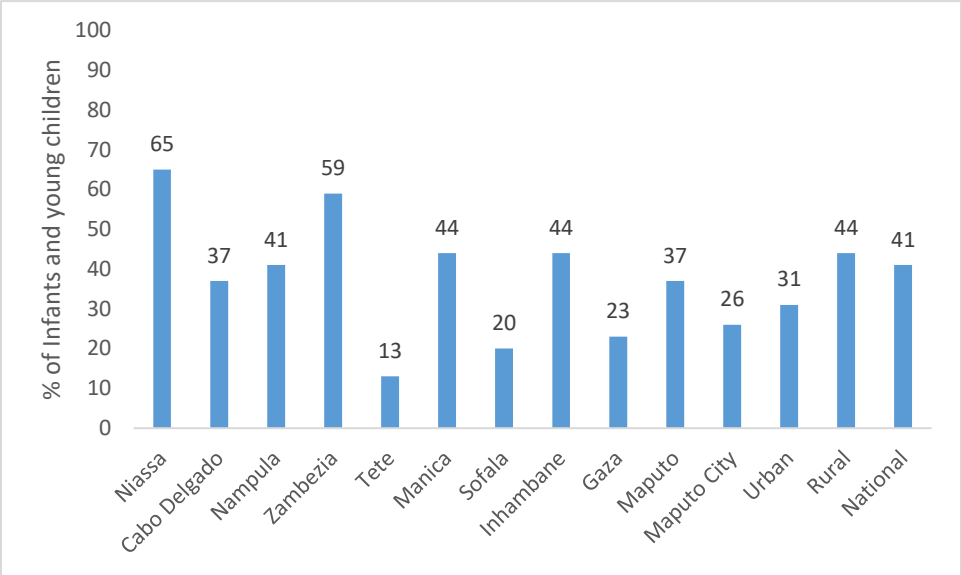
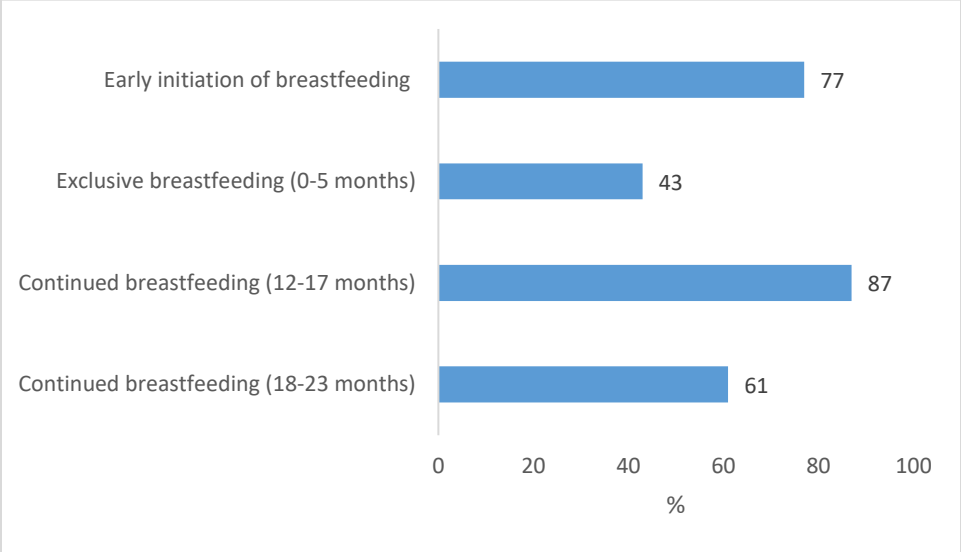


Figure 59: Breastfeeding indicators 2011 (of surveyed IYC) (SETSAN 2014)



A qualitative study[24] of the knowledge, beliefs and practices of mothers, fathers, grandmothers and nurses surrounding breastfeeding in Gaza, Tete, Zambezia, Nampula and Maputo City found many barriers to exclusive breastfeeding including: 1) the practice of providing water, traditional

[24] The study included 9 sites (urban and rural sites in Gaza, Tete, Zambezia and Nampula and the urban site of Maputo City) with four focus group discussions in each involving: 1) mothers of children under 2 (n=95), 2) mothers-in-law or grandmothers (n=82), 3) fathers of children under 2 (n=85) and 4) maternal and child health nurses (n=80) (Arts et al. 2011). 36 focus groups included 8-12 participants who were asked about initiation of breastfeeding, available support for breastfeeding, decision making about infant feeding, additional foods and liquids provided to children under 6 months, perceptions of the feasibility of exclusive breastfeeding and knowledge and perceptions of HIV-positive women (Arts et al. 2011).

medicines and porridge to children under six months, 2) limited knowledge of the six month exclusive breastfeeding recommendation and 3) insufficient counselling skills among nurses (Arts et al. 2011).

The study found that breastfeeding was not always initiated in the first hour, as recommended, due to the perceived need for the mother to rest and bathe after delivery (Arts et al. 2011). Some respondents said that the first milk, the colostrum, was not good for the baby (Arts et al. 2011). Breastfeeding was nearly universal but other foods and liquids were introduced during the first six months, specifically water, traditional medicine, usually given as tea, to treat common illnesses such as diarrhoea, and porridges (papas) (Arts et al. 2011). Traditional medicine was often given within the first few weeks (Arts et al. 2011). Mothers said it was hard to refuse traditional medicine for a child when a grandmother suggested it and believed traditional medicines were helpful because the mothers themselves were thought to have benefitted from them as children (Arts et al. 2011). Porridges are given on the assumption that children need to practice eating soft or blended foods before eating solid foods and many mothers believe children need additional food besides breast milk to grow (Arts et al. 2011).

In the study, all four groups surveyed (mothers, mothers-in-law/grandmothers, fathers and nurses) believed they had some influence in decisions related to the introduction of complementary food (Arts et al. 2011). Many mothers had heard of the recommendation to breastfeed exclusively for six months but many mothers-in-law, mothers' mothers and fathers were not aware of this recommendation and had doubts on the feasibility of exclusive breastfeeding, especially for mothers who work or study outside the house (Arts et al. 2011). Some mothers-in-law/grandmothers and fathers expressed a willingness to support exclusive breastfeeding, especially if the recommendation came from health centres (Arts et al. 2011).

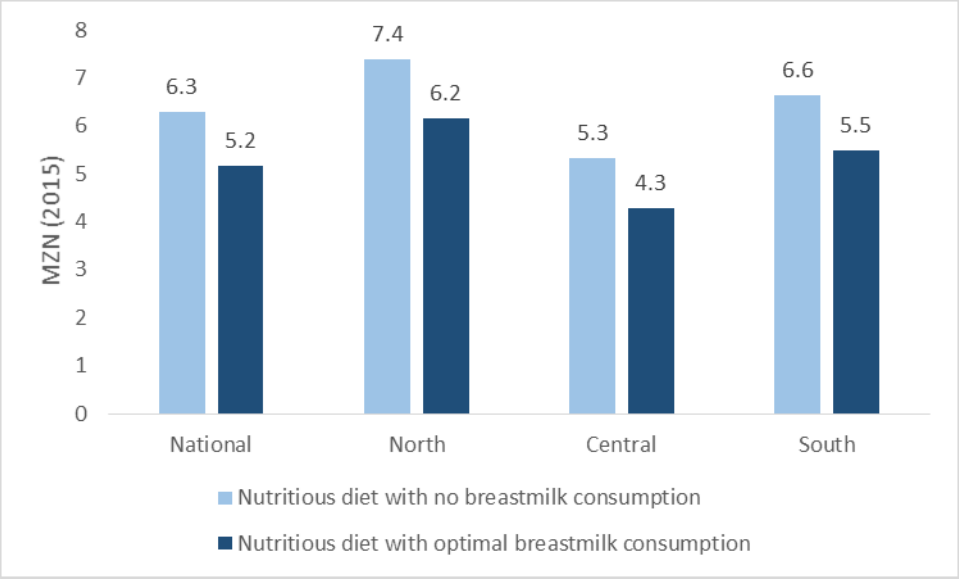
Nurses were aware of the recommendations for exclusive breastfeeding, and were aware of the current Ministry of Health recommendation for mothers with HIV, however many nurses said they did not have time or aids for counselling (Arts et al. 2011). Nurses suggested that it would be helpful to provide recommendations to fathers and mothers-in-law/grandmothers who were less knowledgeable of exclusive breastfeeding recommendations and had important influence in infant-feeding decisions (Arts et al. 2011). Nurses were aware of exclusive breastfeeding guidelines but had insufficient knowledge of how to overcome constraints to breastfeeding (such as insufficient milk, engorgement, pain and cracked nipples) at times contributing to the discontinuation of exclusive breastfeeding as a result (Arts et al. 2011). These findings suggest that involving other influential family members in communication strategies and strengthening the capacity of health staff could improve exclusive breastfeeding rates (Arts et al. 2011).

CotD modelling: Cost of 12-23 month child with adequate breastfeeding, compared to no breastfeeding

Continued breastfeeding rates in Mozambique are higher than exclusive breastfeeding rates. To estimate the effect of breastfeeding on the cost of a nutritious diet for children 12-23 months CotD analysis compared the cost of providing a nutritious diet for a child 12-23 months breastfed at the age appropriate quantity (532 mL per day) and a child who is not breastfed. The

results show that breastfeeding a child reduces the cost of a nutritious diet for a child 12-23 months from 6.3 MZN per day to 5.2 MZN[25] (Figure 60).

Figure 60: Daily cost of a nutritious diet with optimal breastmilk consumption and no breastmilk consumption for a child 12-23 months



Minimum Acceptable Diet and Dietary Diversity for IYC

A national survey as part of a mid-term review of ESAN II found that only 11% of children 6-23 months had a minimum acceptable diet[26] (MAD) (SETSAN 2014). Minimum meal frequency[27] (MMF) and minimum dietary diversity[28] (MDD) were both very low, 38% and 30% respectively (SETSAN 2014). MMF was lowest in Maputo and highest in Cabo Delgado; the low meal frequency in Maputo was possibly due to time constraints of mothers in the urban setting (SETSAN 2014). MDD was particularly low in Inhambane (18%), Tete (19%), Gaza (27%), Sofala (27%) and Zambezia (28%) (Figure 61) (SETSAN 2014). The highest level of MAD was 20% in Cabo Delgado (SETSAN 2014). This is a very low level indicating that the meal frequency and dietary diversity of children 6-23 months are problematic throughout Mozambique (SETSAN 2014). There was little difference in MAD by wealth quintile (Figure 62) indicating that a substantial increase in household income – even beyond that of the 90th percentile -- would be needed to improve child-feeding practices in the short term.

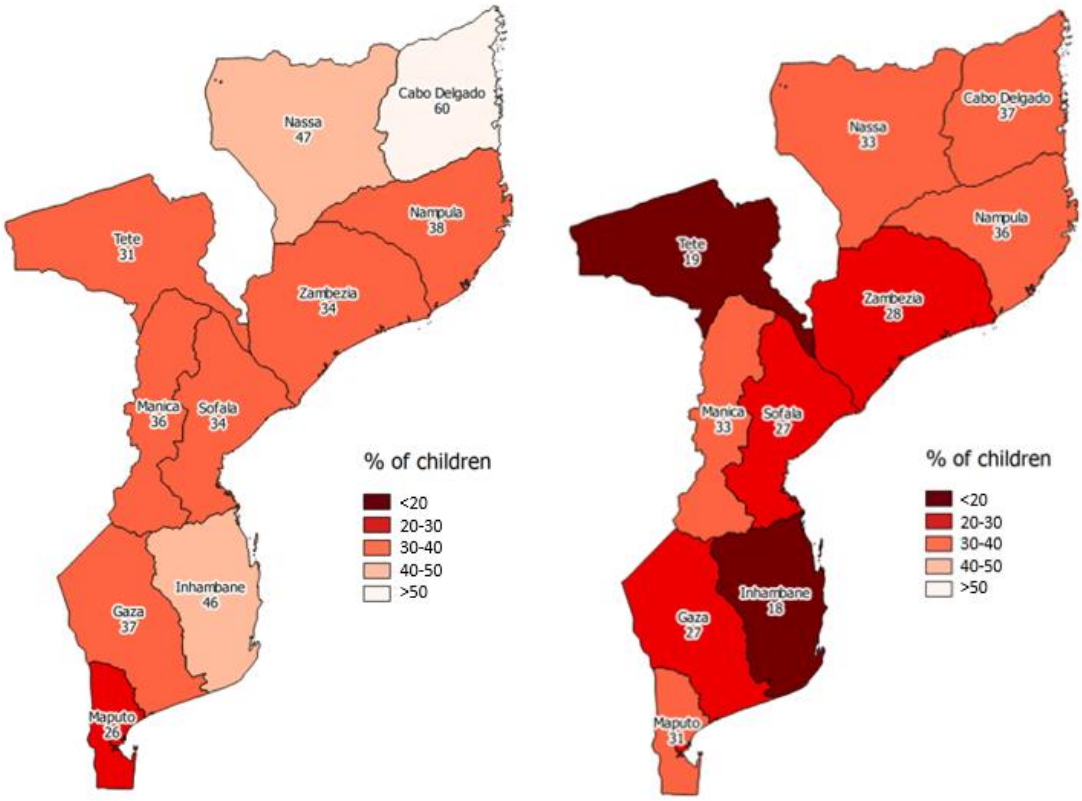
[25] Weighted national average

[26] Minimum acceptable diet - a diet that meets the age-specific criteria of minimum meal frequency (MMF) and minimum dietary diversity (MDD).

[27] Minimum meal frequency - the percentage of children 6-23 months who received solid, semi-solid or soft foods three times or more each day.

[28] Minimum dietary diversity - the percentage of children 6-23 months who ate more than 4 food groups a day.

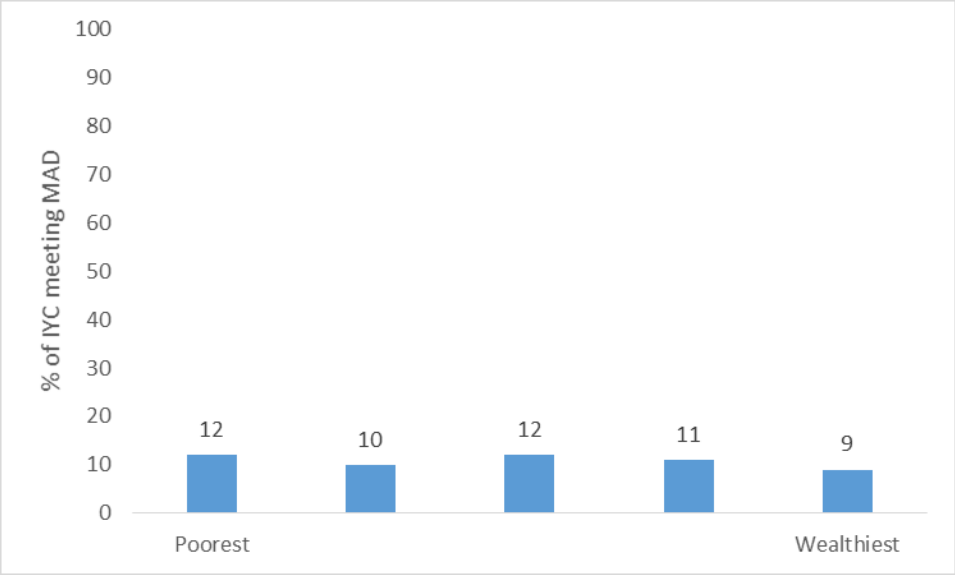
Figure 61: Percentage of children meeting cut offs for a) Minimum Meal Frequency and b) Minimum Dietary Diversity by province (SETSAN 2014)



a) Minimum meal frequency (MMF)

b) Minimum dietary diversity (MDD)

*Figure 62: Percentage of IYC meeting Minimum Acceptable diet by **Wealth Quintile,** National Average (SETSAN 2014)*



CotD Modelling: Improved nutrient intake for children under 2

CotD analysis was used to estimate the impact of multiple interventions to improve nutrient intake of children under 2 (Table 6 and Table 7). Looking at the national averages of specialized nutritious food interventions, Nutributter could reduce the daily cost of the nutritious diet by 44%, Super Cereal could reduce the daily cost of the nutritious diet by 29% and micronutrient powders could reduce the daily cost of the nutritious diet by 15% (Figure 63). All three interventions would reduce the cost of the nutritious diet across North, South and Centre regions.

Looking at the national average of natural food interventions for children under two delivered via vouchers 50 g of green leafy vegetables (GLV) could reduce the daily cost of the nutritious diet by 21%, 20g of beans could reduce the daily cost of the nutritious diet by 12% and 60g of orange flesh sweet potato (OFSP) could reduce the daily cost of the nutritious diet by 8% (Figure 64). For animal source foods, 40g of egg (equivalent to one egg) could reduce the daily cost of the nutritious diet by 25% and 10g of milk powder could reduce the daily cost of the nutritious diet by 15% (Figure 65).

Of all interventions modelled, combinations of natural foods delivered via vouchers could have the biggest impact. Provision of beans and green leafy vegetables could reduce the daily cost of the nutritious diet by 30%, provision of beans, green leafy vegetables and egg could reduce the daily cost of the nutritious diet by 52%, provision of beans, green leafy vegetables, egg and mango could reduce the cost of the nutritious diet by 53% and provision of beans, green leafy vegetables, egg and orange flesh sweet potato could reduce the daily cost of the nutritious diet by 55% (Figure 66).

Table 6: CotD modelling: Specialized nutritious food and natural food based interventions for children under 2

Commodity	Daily quantity	Frequency	Modality
Specialized nutritious foods			
Nutributter	20g	Daily	In-kind
Micronutrient powder	1g	3x per week	In-kind
Super cereal	60g	Daily	In-kind
Natural foods			
Beans	20g	Daily	Voucher
Orange Flesh Sweet Potato (OFSP)	60g	Daily	Voucher
Green leafy vegetables (GLV)	50g	Daily	Voucher
Tomato	30g	Daily	Voucher
Banana	60g	Daily	Voucher
Mango	60g	Daily	Voucher
Fish	10g	Daily	Voucher
Egg	40g	Daily	Voucher
Chicken	10g	Daily	Voucher
Milk powder	10g	Daily	Voucher

Table 7: CotD modelling: Specialized nutritious food and natural food based interventions for children under 2

Commodity	Daily quantity					Frequency	Modality
	Beans	Green leafy vegetables	Egg	Mango	Orange Flesh Sweet Potato (OFSP)		
Beans and GLV	20g	50g				Daily	Voucher
Beans, GLV and egg	20g	50g	40g			Daily	Voucher
Beans, GLV, egg and mango	20g	50g		60g		Daily	Voucher
Beans, GLV, egg and OFSP	20g	50g	40g		60g	Daily	Voucher

Figure 63: Remaining cost to the household of the diet for children aged 12-23 months when child receives a specialized nutritious food (CotD analysis 2017)

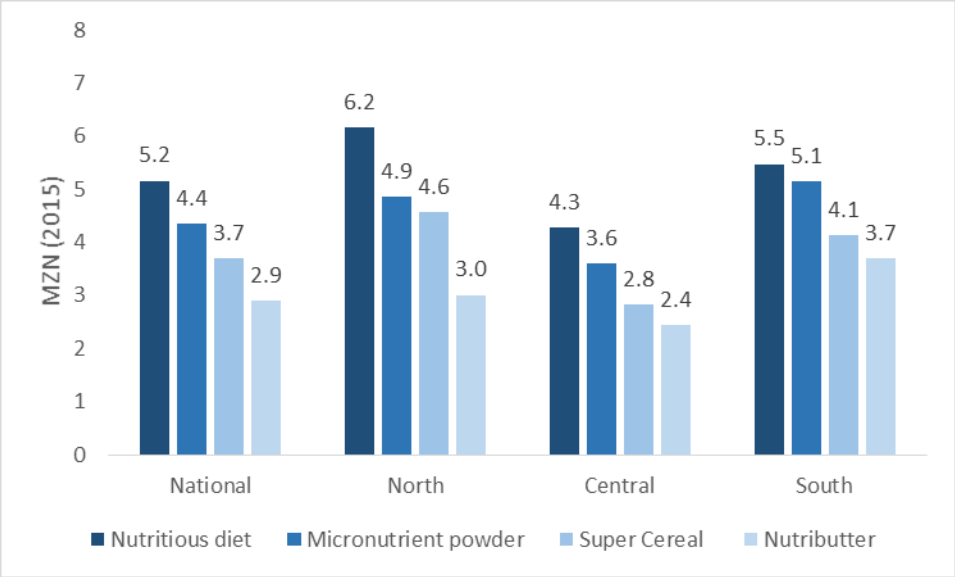


Figure 64: Remaining cost to the household of the diet for children aged 12-23 months when child receives a fruit or vegetable (CotD analysis 2017)

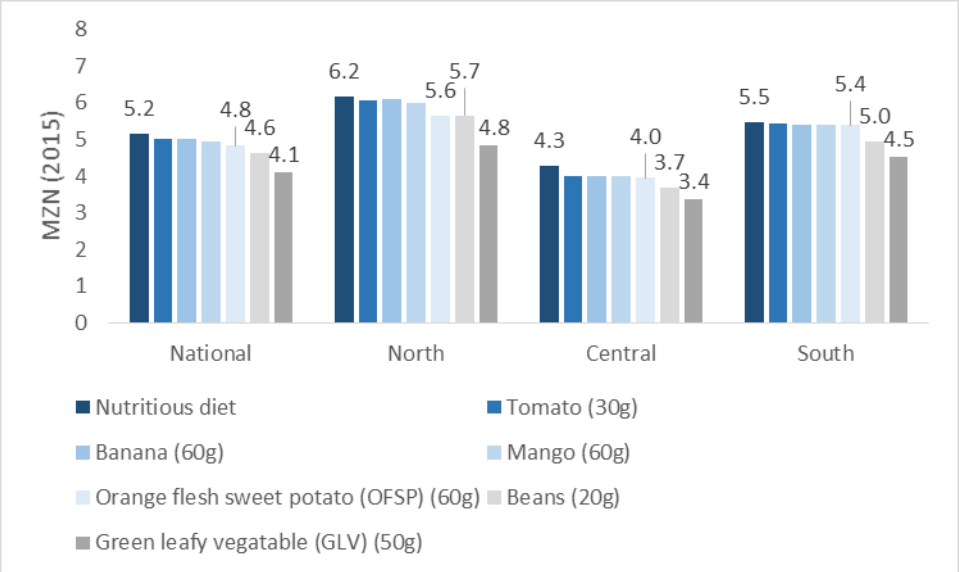


Figure 65: Remaining cost to the household of the diet for children aged 12-23 months when child receives an animal-source food (CotD analysis 2017)

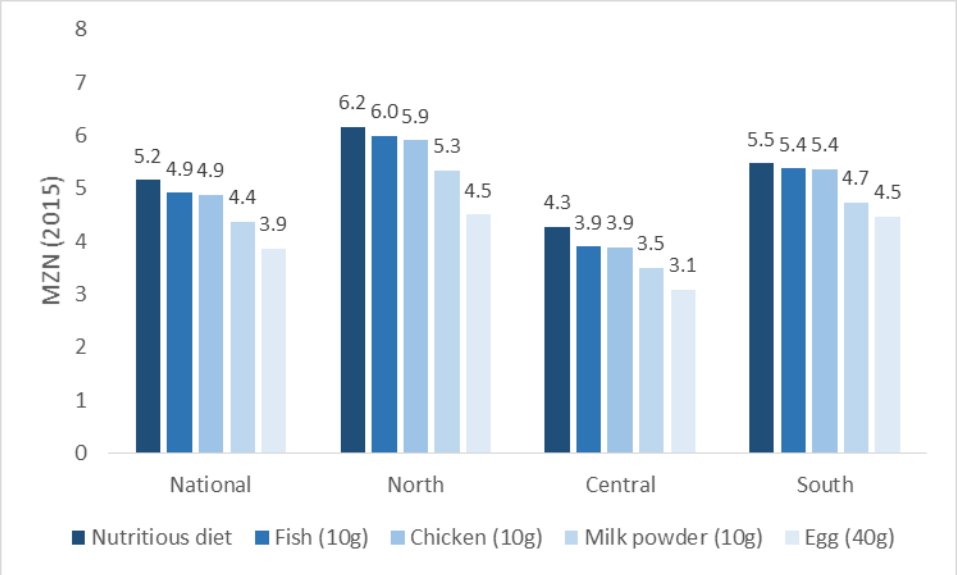
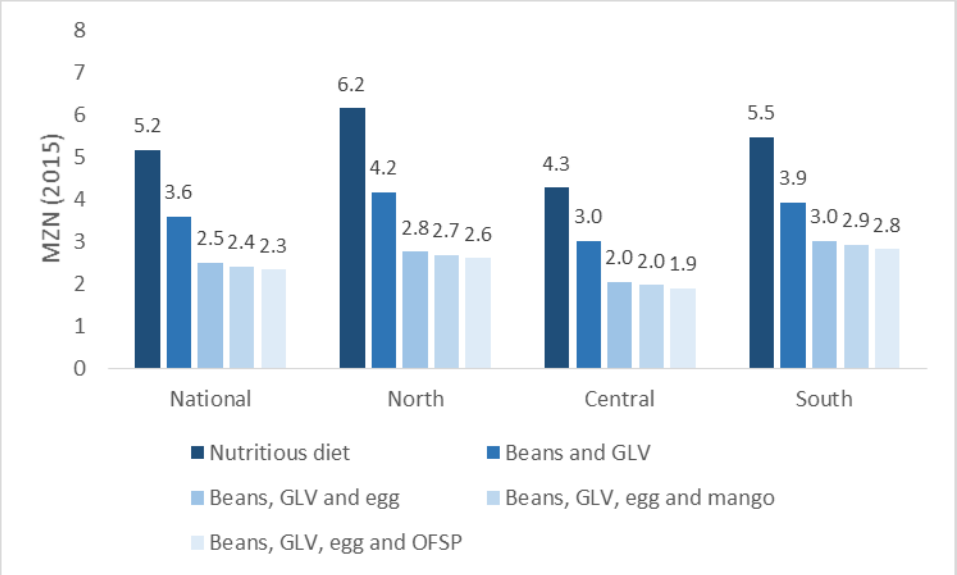


Figure 66: Daily cost of a nutritious diet for children under 2 with combinations of natural food interventions (CotD analysis 2017)



Key Message 8: The diets of adolescent girls and women are poor and contribute to malnutrition in children. Targeted interventions can improve nutrient intake for these target groups.

CotD Modelling: Household member contributions to total household cost

CotD software provides an estimate of the cost of a staple-adjusted nutritious diet for each family member in an average household, including a child 12-23 months, a school child 6-7

years, an adolescent girl 14-15 years, an adult man and a lactating woman. In each region the adolescent girl had the most expensive nutrient needs comprising on average 33% of the total household cost and 30 MZN per day (Figure 67 and Figure 68). The lactating woman was the second most expensive family member comprising on average 28% of the total household cost, followed by the man (20%), school aged child (13%) and child under 2 (6%). As foods are not shared in those ratios, and women and girls are unlikely to get a larger share of more nutritious foods (animal source foods, vegetables, fruits or fortified foods), this means that they are more unlikely to meet their nutrient needs.

Figure 67: Percentage of total household cost of the nutritious diet by household member (CotD analysis 2017)

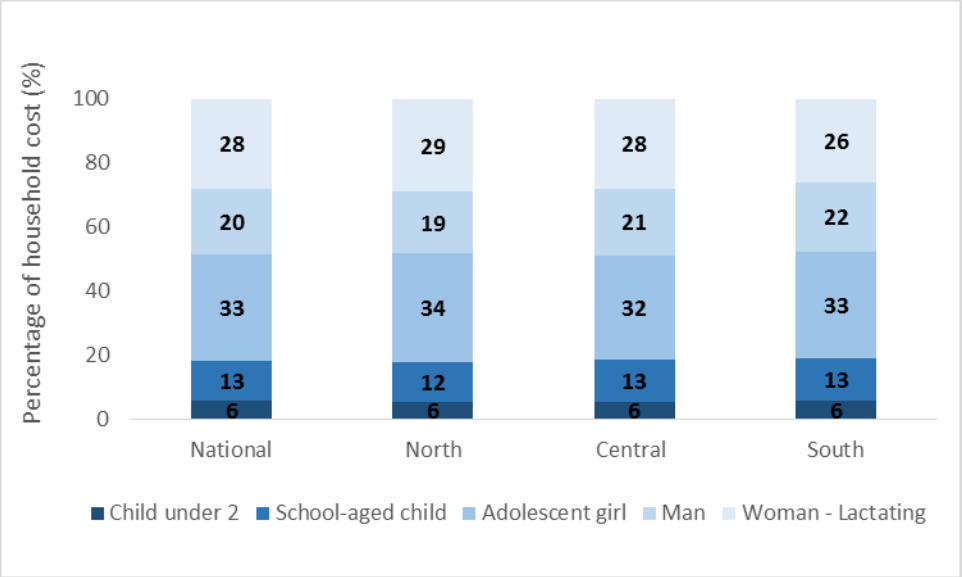
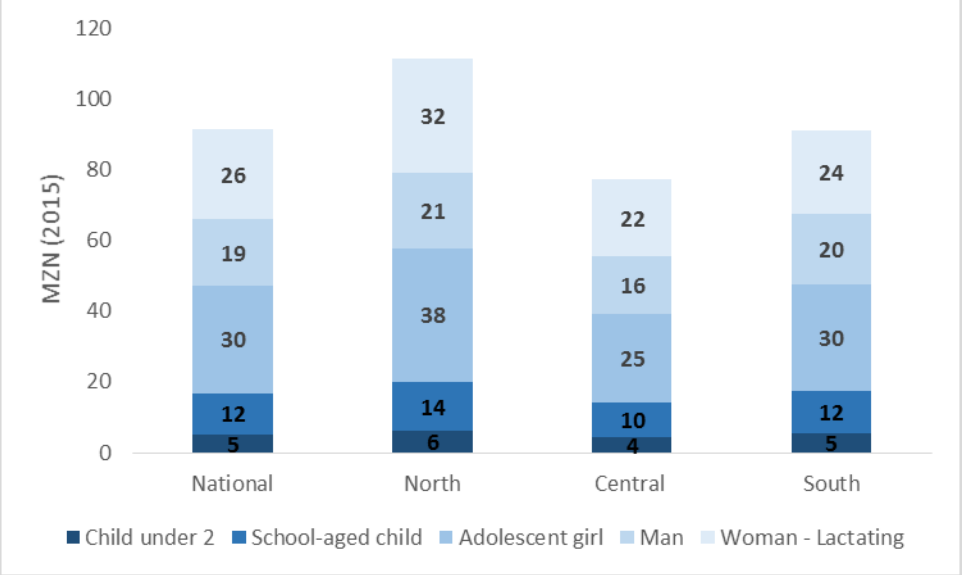
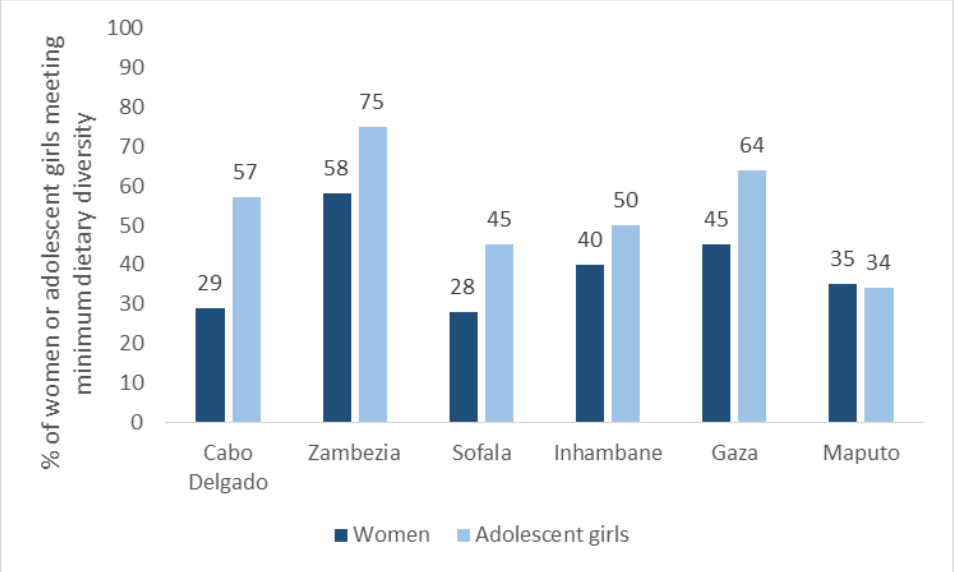


Figure 68: Daily cost of a nutritious diet for each household member (CotD analysis 2017)



Adolescent girls and women face a relatively high cost of a nutritious diet and findings suggest poor nutrient intake for this group in provinces throughout Mozambique. A survey of adolescent girls (15-19 years old) and women of reproductive age (15-49 years old) in Cabo Delgado, Zambezia, Sofala, Inhambane, Gaza and Maputo found that only 54% of adolescent girls and 36% of WRA met the indicator for minimum dietary diversity (MDD), based on consumption of more than five food groups in the last 24 hours (IFAD 2016). The average number of food groups consumed across the six province sample was 4.8 food groups for adolescent girls and 3.9 food groups for women, with the highest percentage of women meeting the MDD indicator in Zambezia and the lowest percentage of women meeting the MDD indicator in Sofala and Maputo (Figure 69) (IFAD 2016).

Figure 69: Percentage of women and adolescent girls meeting minimum dietary diversity (consumption of 5-10 food groups in the last 24 hours) (IFAD 2016)



CotD Modelling: Improved nutrient intake for adolescent girls

To estimate the impact of interventions that could improve nutrient intake for adolescent girls Cost of the Diet analysis modelled specialized nutritious foods and natural food based interventions (Table 8 and Table 9). On average iron and folic acid tablets were most effective[29]

[29] Iron and folic acid supplements were more effective than multi micronutrient tablets because the vitamin A in multi micronutrient tablets made it more likely the adolescent girl would hit an upper limit for vitamin A. As a result the adolescent girl's nutritious diet with MMTs had lower quantities of affordable nutritious foods that were high in vitamin A than the nutritious diet with iron and folic acid supplements and the alternative foods selected in the diet with MMTs increased the cost comparatively.

reducing the cost of the nutritious diet by 30% (Figure 70). A voucher for green leafy vegetables could reduce the cost of the nutritious diet by 10% (Figure 71), a voucher for egg could reduce the cost by 7% (Figure 72) and a combination voucher for beans, green leafy vegetables, eggs and orange flesh sweet potato could reduce the cost of the nutritious diet by 22% (Figure 73)Figure 73: Daily cost of a nutritious diet for adolescent girls with combinations of natural food interventions (CotD analysis 2017).

Table 8: CotD modelling: Specialized nutritious food and natural food based interventions for adolescent girls

Commodity	Daily quantity	Frequency	Modality
Specialized nutritious foods			
Multi-micronutrients tablets	1g	Daily	In-kind
Iron and folic acid supplement	1g	Daily	In-kind
Super cereal	120g	Daily	In-kind
Natural foods			
Beans	50g	Daily	Voucher
Orange Flesh Sweet Potato (OFSP)	150g	Daily	Voucher
Green leafy vegetables (GLV)	150g	Daily	Voucher
Tomato	80g	Daily	Voucher
Banana	120g	Daily	Voucher
Mango	120g	Daily	Voucher
Fish	40g	Daily	Voucher
Egg	40g	Daily	Voucher
Chicken	40g	Daily	Voucher
Milk powder	40g	Daily	Voucher

Table 9: CotD modelling: Specialized nutritious food and natural food based interventions for adolescent girls

Commodity	Daily quantity					Frequency	Modality
	Beans	Green leafy vegetables	Egg	Mango	Orange Flesh Sweet Potato (OFSP)		
Beans and GLV	50g	150g				Daily	voucher
Beans, GLV and egg	50g	150g	40g			Daily	voucher

Beans, GLV, egg and mango	50g	150g		120g		Daily	voucher
Beans, GLV, egg and OFSP	50g	150g	40g		150g	Daily	voucher

Figure 70: Daily cost of a nutritious diet for adolescent girls with specialized nutritious food interventions (CotD analysis 2017)

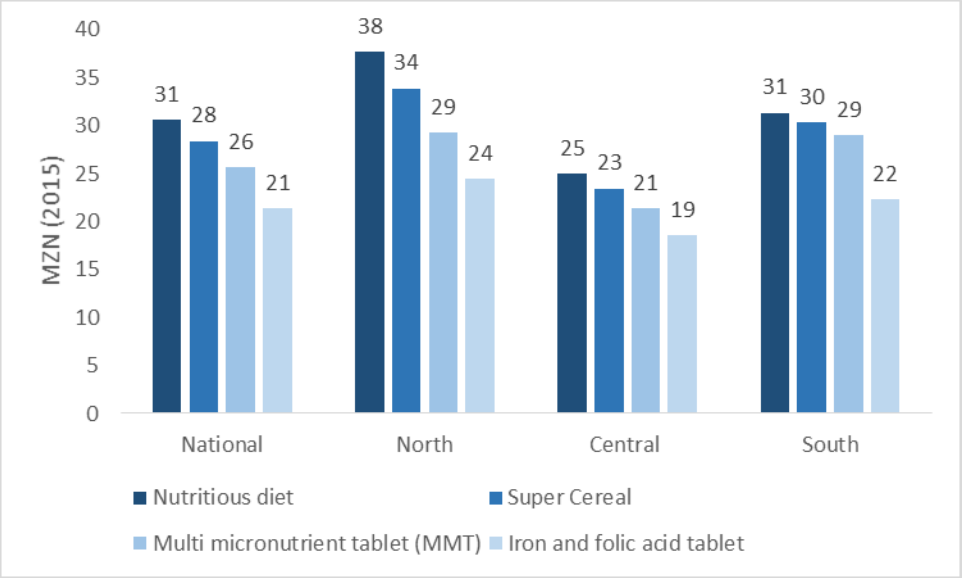


Figure 71: Daily cost of a nutritious diet for adolescent girls with fruit and vegetable interventions (CotD analysis 2017)

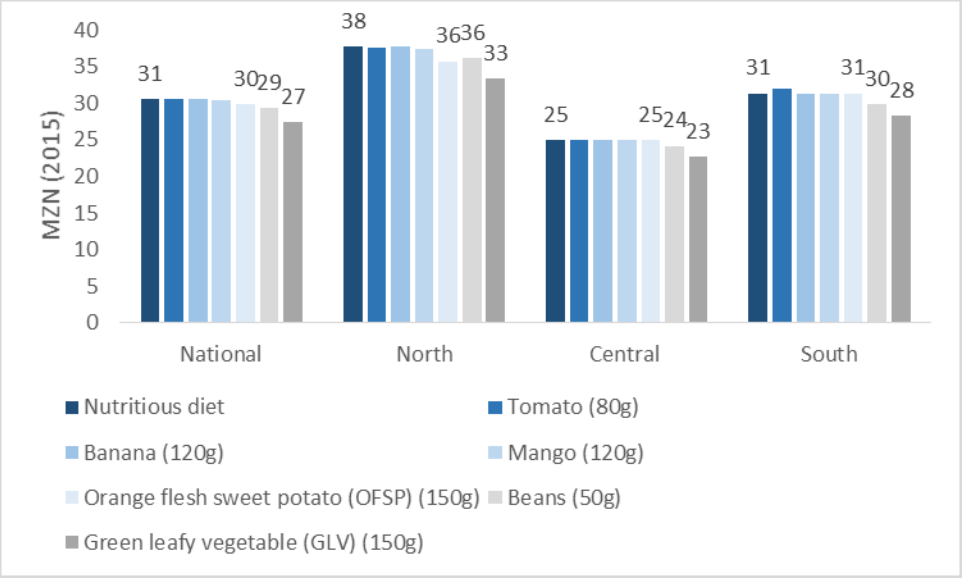


Figure 72: Daily cost of a nutritious diet for adolescent girls with animal source food interventions (CotD analysis 2017)

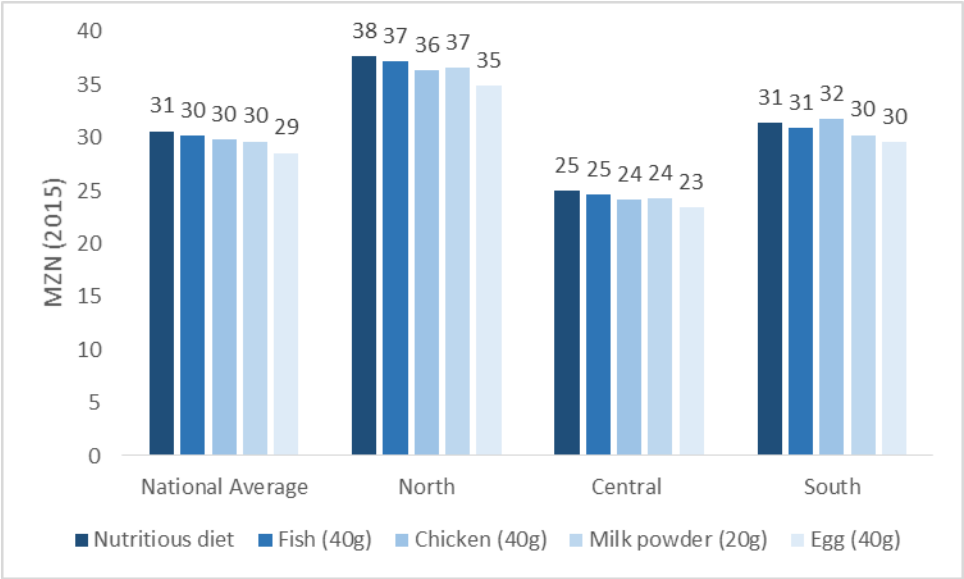
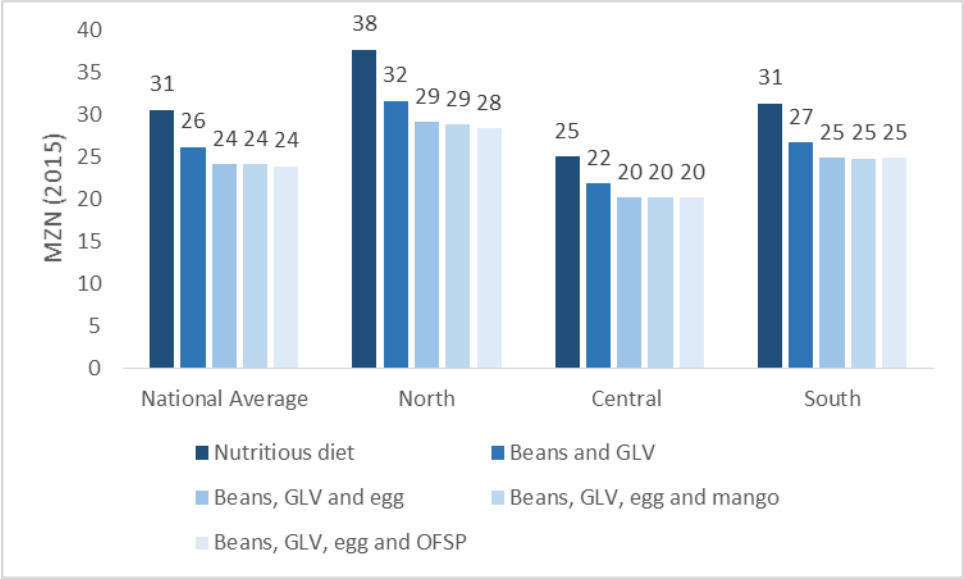


Figure 73: Daily cost of a nutritious diet for adolescent girls with combinations of natural food interventions (CotD analysis 2017)



CotD Modelling: Improved nutrient intake for lactating women

To estimate the impact of interventions that could improve nutrient intake for lactating women Cost of the Diet analysis modelled specialized nutritious foods and natural food based interventions (Table 10 and Table 11). On average a medium quantity lipid-based nutrient supplement (MQ-LNS) was most effective reducing the cost of the nutritious diet by 29%, followed by Super Cereal which could reduce the cost of the nutritious diet by 22%, MMTs which could reduce the cost of the nutritious diet by 13% and iron and folic acid supplements which could reduce the cost of the nutritous diet by 8% (Figure 74). A voucher for green leafy vegetables could reduce the cost of the nutritious diet by 10% and a voucher for orange flesh sweet potato could reduce the cost of the nutritious diet by 9% (Figure 75).

A voucher for egg could reduce the cost by 8% (

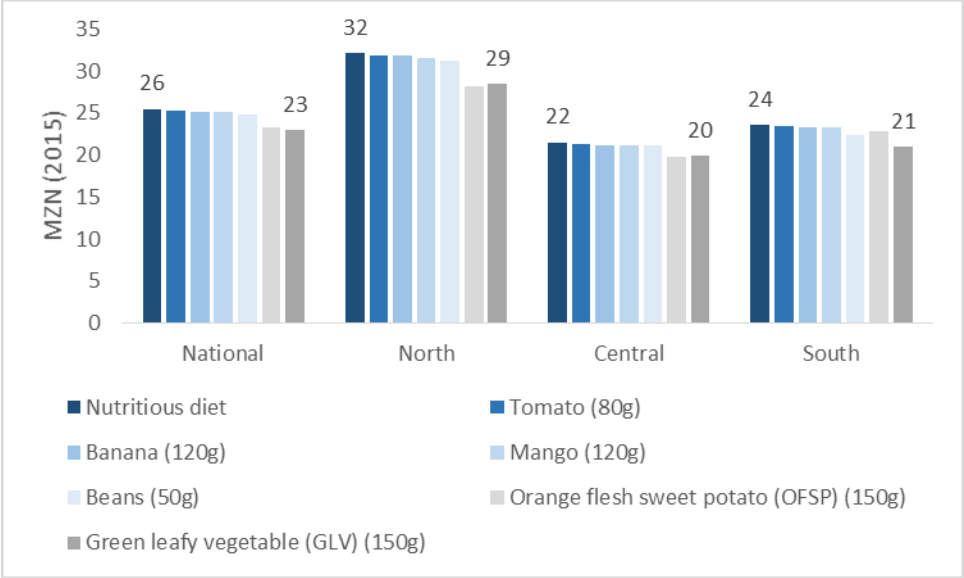


Figure 76) and a combination voucher for beans, green leafy vegetables, eggs and orange flesh sweet potato could reduce the cost of the nutritious diet by 30% (Figure 77).

Table 10: CotD modelling: Specialized nutritious food and natural food based interventions for lactating women

Commodity	Daily quantity	Weekly frequency	Modality
Specialized nutritious foods			
Multi-micronutrients tablets	1g	Daily	In-kind
Iron and folic acid supplement	1g	Daily	In-kind
MQ-LNS	75g	Daily	In-kind
Super cereal	120g	Daily	In-kind
Natural foods			
Beans	50g	Daily	Voucher
Orange Flesh Sweet Potato (OFSP)	150g	Daily	Voucher
Green leafy vegetables	150g	Daily	Voucher
Tomato	80g	Daily	Voucher
Banana	120g	Daily	Voucher
Mango	120g	Daily	Voucher

Fish	40g	Daily	Voucher
Egg	40g	Daily	Voucher
Chicken	40g	Daily	Voucher
Milk powder	40g	Daily	Voucher

Table 11: CotD modelling: Specialized nutritious food and natural food based interventions for lactating women

Commodity	Daily quantity					Frequency	Modality
	Beans	Green leafy vegetables	Egg	Mango	Orange Flesh Sweet Potato (OFSP)		
Beans and GLV	50g	150g				Daily	Voucher
Beans, GLV and egg	50g	150g	40g			Daily	Voucher
Beans, GLV, egg and mango	50g	150g		120g		Daily	Voucher
Beans, GLV, egg and OFSP	50g	150g	40g		150g	Daily	Voucher

Figure 74: Daily cost of a nutritious diet for lactating women with specialised nutritious food interventions (CotD analysis 2017)

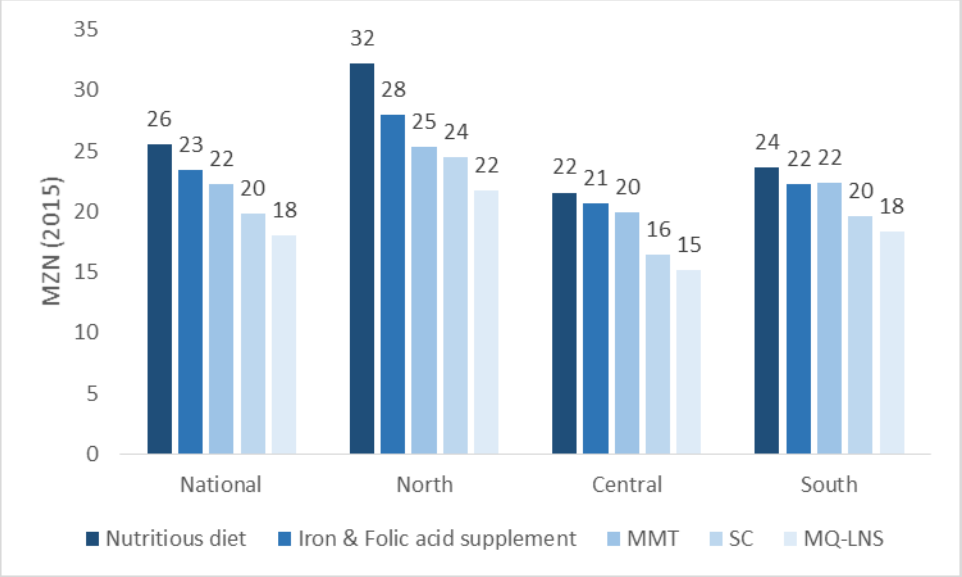


Figure 75: Daily cost of a nutritious diet for lactating women with fruit and vegetable interventions (CotD analysis 2017)

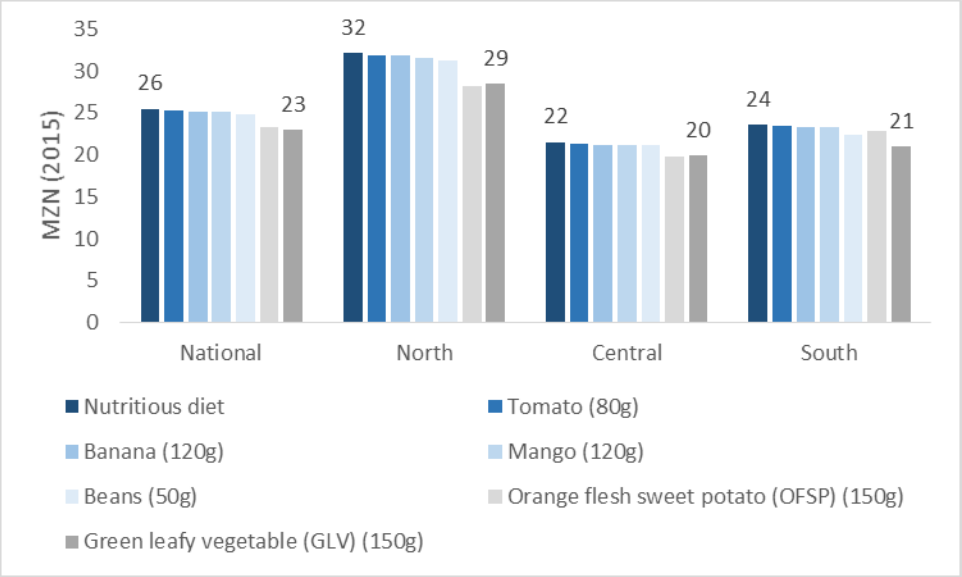


Figure 76: Daily cost of a nutritious diet for lactating women with animal source food interventions (CotD analysis 2017)

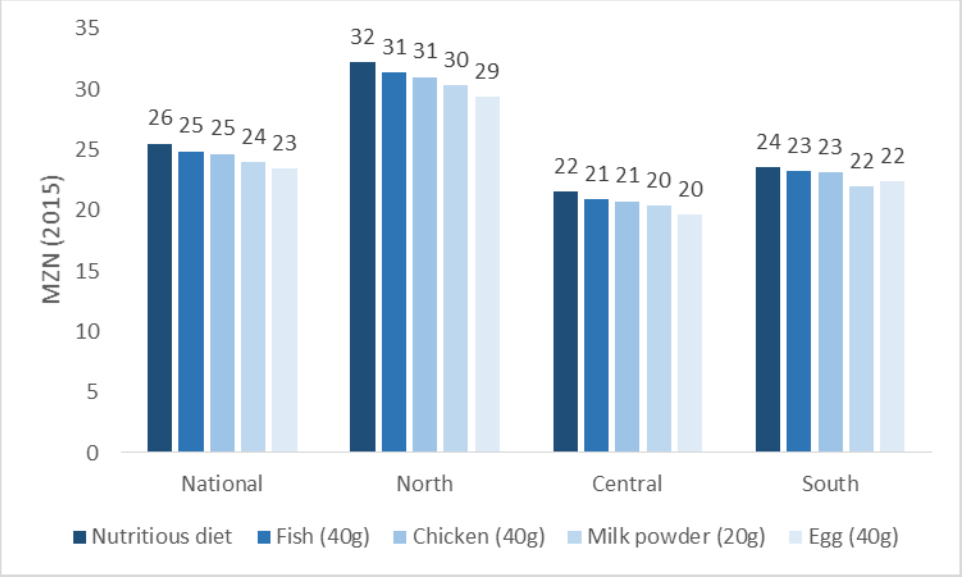
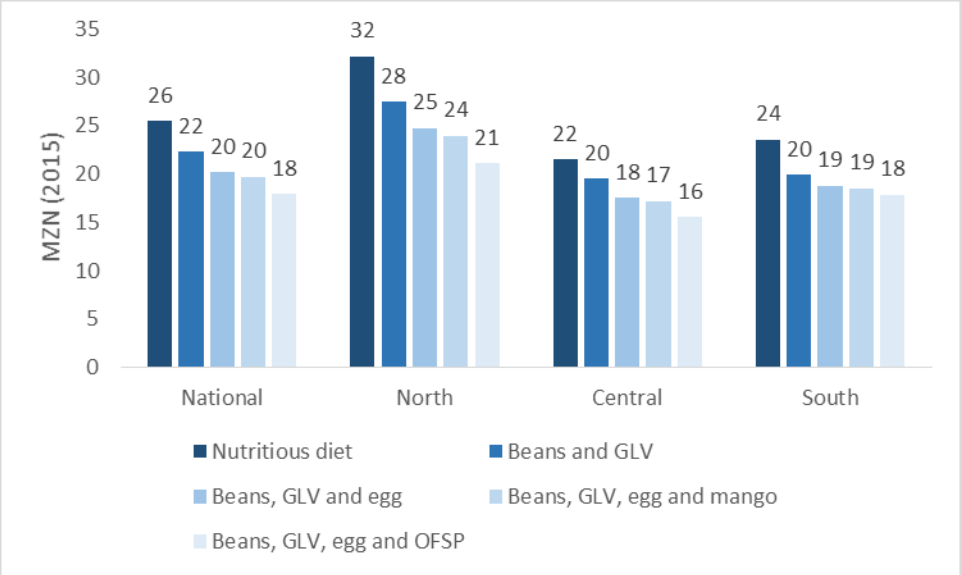


Figure 77: Daily cost of a nutritious diet for lactating women with combinations of natural food interventions (CotD analysis 2017)



Key Message 9: School feeding programs can improve nutrient intake for school-aged children

The 2013 Programa nacional de alimentação escolar (PRONAE) highlights school feeding as a government priority and states the goal of expanding school feeding to all pre-primary and primary schools in Mozambique, with an emphasis on local procurement, community participation and nutrition education (World Food Programme 2017b). The WFP Mozambique Country Strategic Plan (2017-2021) states that WFP will seek to make the national school feeding programme more nutrition-sensitive (World Food Programme 2017b). PRONAE piloted an initiative targeting 12 schools and 14,141 students in 10 districts in Gaza, Manica, Nampula and Tete with a school feeding programme based on diversified diets (cereals, beans, vegetables and fruits) (Swensson & Klug 2017). An additional US$40M has been secured in a debt swap between the Russian Federation and Mozambique that will provide school meals for 150,000 children in Mozambique from 2017-2021 (World Food Programme 2017c). PRONAE builds on the experience of the School Feeding Programme Transition Project, led by WFP and the Government of Mozambique (MINEDH) in 2014-2015. The Transition Project targeted 175 schools and 75,520 students in Cahora Bassa and Changara districts in Tete province with a school feeding programme based on fortified maize, pulses enriched vegetable oil and salt (Swensson & Klug 2017).

CotD Modelling: Improved nutrient intake for school-aged children through school feeding

CotD analysis modelled possible school feeding packages that could improve the nutrient intake of school-aged children with nutrition-sensitive packages (Table 12). The most effective intervention with fortified maize and oil, eggs and milk powder and could reduce the

cost of a nutritious diet for children by 50%[30] (Figure 78). CotD analysis evaluated the potential impact of ongoing school feeding programs in Niassa, Cabo Delgado, Nampula and Manica that included an MNP (Table 13). If these packages were implemented nationwide the most effective package with egg, fortified foods and an MNP would reduce the cost of a nutritious diet by 21% (

Figure *79*).

Table 12: CotD modelling: School feeding packages

	Yogurt snack	**Basic package**	**Fortified ration**	**Fortified ration with fruits and vegetables**	**Fortified package with frozen fish**	**Fortified package with dried fish**	**Fortified package with yogurt**	**Fortified package with eggs**	**Fortified package with milk**	**Fortified package with Super Cereal**	**Fortified package with eggs and milk**
Maize		150g									
Beans		30g	30g	30g			30g	30g	30g		30g
Vegetable oil		10g									
Fortified Maize			150g	100g	100g	100g		100g	150g		100g
Fortified vegetable oil			10g	10g	10g	10g		10g	10g		10g
Amaranth leaf				30g							
Tomato				20g							
Eggs								40g			40g
Milk powder									25g		25g
Yogurt	330mL						330mL				
Dried fish						100g					
Frozen fish					100g						
Super cereal										60g	
Frequency (days per week)	2	6	6	6	2	2	2	6	6		6

[30] National weighted average based on all provinces

Figure 78: Daily cost of a nutritious diet for school-aged children with school feeding interventions (CotD analysis 2017)

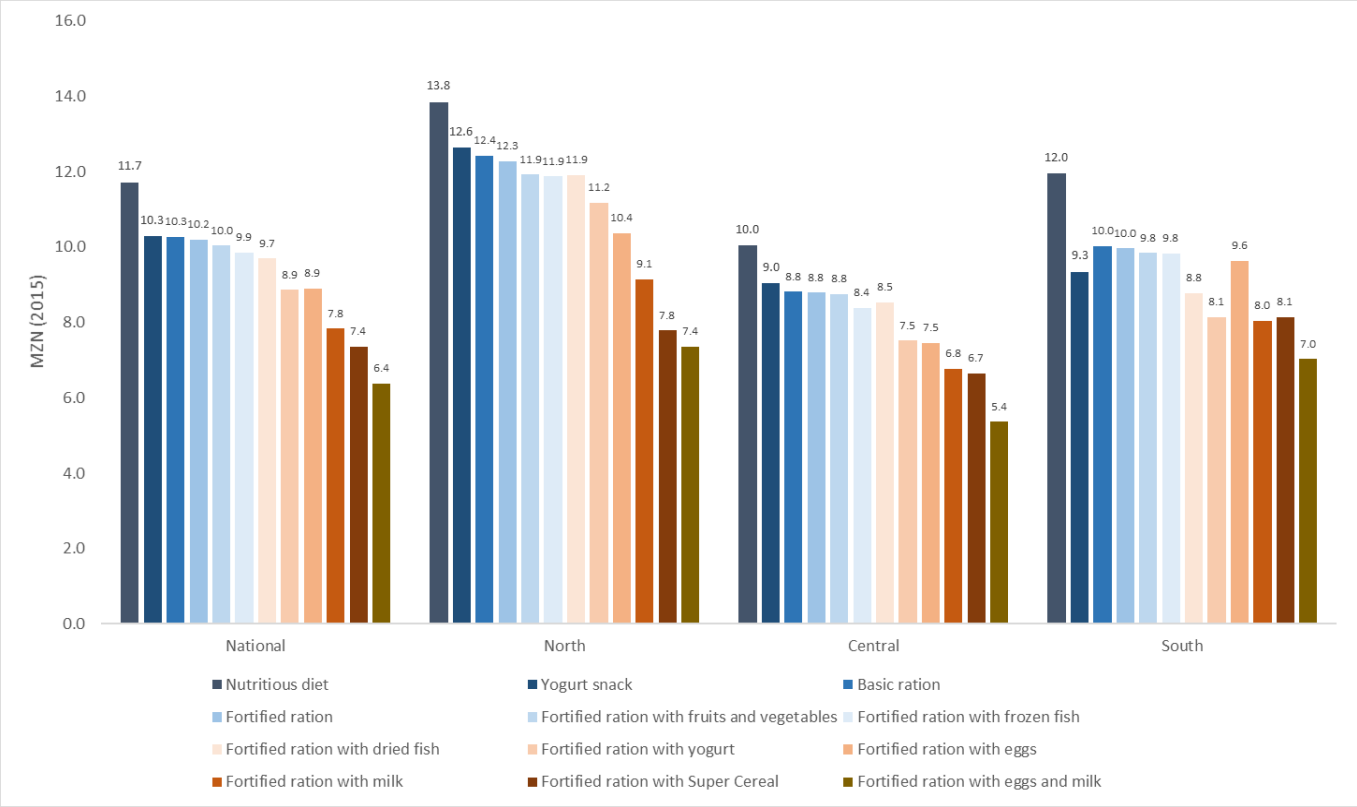
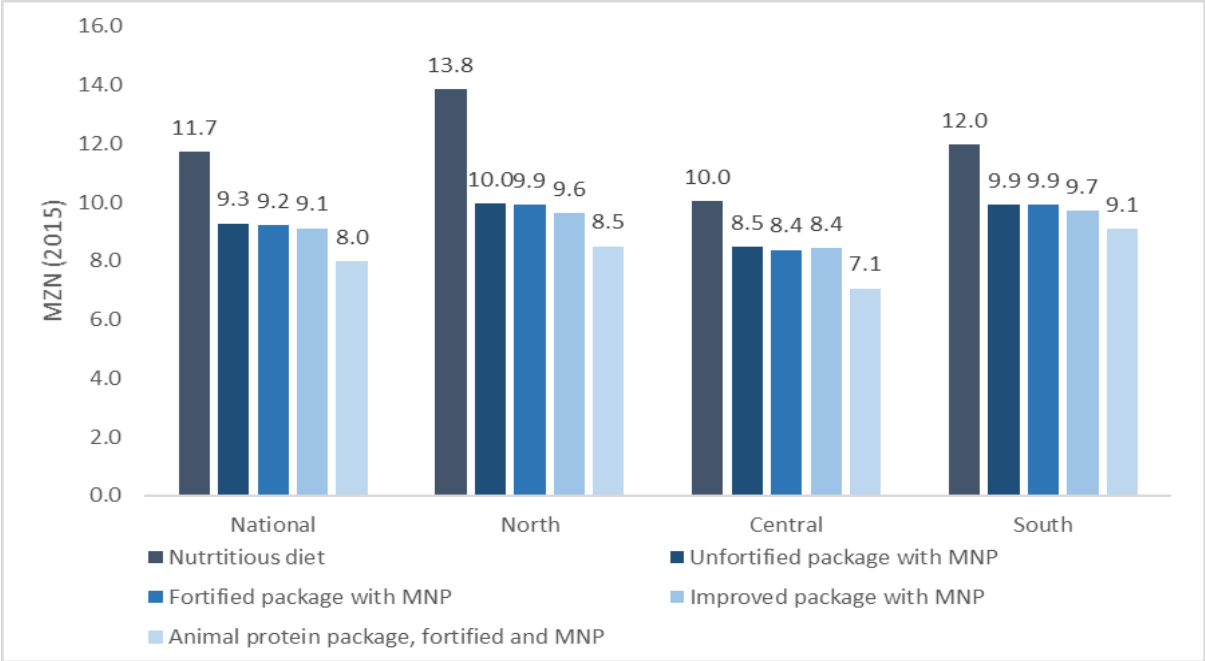


Table 13: CotD modelling: School feeding packages with MNP

	Unfortified package with MNP	Fortified package with MNP	Improved package with MNP	Animal protein package, fortified and MNP
Maize	150g			
Beans	30g	30g	30g	30g
Vegetable oil	10g			
Fortified maize		150g	100g	100g
Fortifed vegetable oil		10g	10g	10g
Amaranth leaf			30g	
Tomato			20g	
Eggs				40g
Micronutrient powder	0.4g	0.4g	0.4g	0.4g

Frequency (days per week)	6	6	6	6

Figure 79: Daily cost of a nutritious diet for school-aged children with school feeding interventions that include Micronutrient Powders (CotD analysis 2017)



Key Message 10: Interventions targeted at the household can increase the likelihood of meeting nutrient requirements as they reduce the percentage of households that are unable to afford a nutritious diet.

Effective interventions for key target groups can be combined to create packages (Table 14) with the potential to reduce the cost of a nutritious diet for households throughout Mozambique. A package of supplements for key target groups could reduce the daily cost of a nutritious diet by 17%[31]; a package of fortified special foods for key target groups could reduce the daily cost of a nutritious diet by 19%[32]; a package of agricultural and market interventions with natural nutritious foods could reduce the daily cost of a nutritious diet by 37%[33]; and a combination of targeted interventions with fortified crops available on the market and household production of biofortified crops could reduce the cost of a nutritious diet by 34%[34] (Figure 80).

Comparing the cost of the nutritious diet with packages of interventions allows for an estimation of the percentage of households able to afford a nutritious diet. At present an estimated 54% of households are unable to afford a nutritious diet in Mozambique. With

[31] Based on a weighted national average of all provinces
[32] Based on a weighted national average of all provinces
[33] Based on a weighted national average of all provinces
[34] Based on a weighted national average of all provinces

package 3 of agricultural and market interventions with natural nutritious foods this figure could be reduced to 29% (Figure 81). Cash transfers of 610 MZN and 1785 MZN adds to the diet **430 MZN** – based on 70% spent on food of the 610 MZN transfer provided to eligible households in the Basic Social Subsidy Program that accounts for 80% of INAS cash transfers – and **1250 MZN –** based on 70% spent on food of a cash transfer that reflects 30% of total expenditure for a household below the national poverty line as recommended by the World Bank (World Bank 2017c). Adding 1250MZN to household food budgets from a 1785 MZN cash transfer reduced the percentage of households unable to afford a nutritious diet from 58% to as low as 3% when combined with package 3 in rural areas and from 48% to 8% when combined with either package 3 or 4 in urban areas (Figure 82).

The effectiveness of cash transfers to improve nutrition depends on: 1) the availability of nutritious foods in local markets and 2) beneficiaries being knowledgeable of healthy eating habits and preferring to purchase nutritious foods. Although the modelling results with cash transfers are encouraging it is important to note that a WFP market assessment in Gaza and Tete found that cash transfers would not be recommendable in most rural areas in these two provinces due to constraints such as distance to markets, poor road infrastructure, weak financial capacity of smaller traders, the potential of local shops to meet food selection and diversity requirements, the escalation of insecurity along main trade routes, the scarcity of local food supplies, trader competition over fewer stocks and the inflationary pressure of food prices (Caccavale et al. 2016). In urban areas cash transfers were endorsed by the mission (Caccavale et al. 2016). In rural areas near urban areas a pilot was recommended to evaluate the effectiveness of cash interventions in this setting (Caccavale et al. 2016).

Table 14: CotD modelling: Household packages (further details available in Appendix Table 6)

Package 1: Supplements for key target groups						
Area		*Child (12-23 months)*	*Child (6-7 years)*	*Adolescent girl (14-15 years)*	*Lactating Woman (30-59 years)*	*Household*
All regions		MNP		MMT	MMT	With and without cash transfers
Package 2: Fortified special foods for key target groups						
Area		*Child (12-23months)*	*Child (6-7 years)*	*Adolescent girl (14-15 years)*	*Lactating Woman (30-59 years)*	*Household*
North and South		Super Cereal		MMT	Super Cereal	With and without cash transfers
Centre		Nutributter		MMT	Super Cereal	With and without cash transfers
Package 3: Agricultural and market interventions with natural nutritious foods						
Area		*Child (12-23months)*	*Child (6-7 years)*	*Adolescent girl (14-15 years)*	*Lactating Woman (30-59 years)*	*Household*
North	Rural	Dried Fish + GLV (voucher)	Improved Package	Dried Fish + GLV (voucher)	Dried Fish + GLV (voucher)	Biofortification and cash transfers
	Urban	Dried Fish + GLV(voucher)	Improved Package	Dried Fish + GLV(voucher)	Dried Fish + GLV(voucher)	Fortification and cash transfers
Centre and South	Rural	Egg + GLV (voucher)	Improved Package	Egg + GLV (voucher)	Egg + GLV (voucher)	Biofortification and cash transfers

	Urban	Egg + GLV (voucher)	Improved Package	Egg + GLV (voucher)	Egg + GLV (voucher)	Fortification and cash transfers
Package 4: Targeted interventions + fortification/biofortification						
Area		*Child (12-23months)*	*Child (6-7 years)*	*Adolescent girl (14-15 years)*	*Lactating Woman (30-59 years)*	*Household*
North and South	Rural	Super Cereal Normal	Improved Package	MMT	Super Cereal	Biofortification and cash transfers
	Urban		Improved Package			Fortification and cash transfers
Centre	Rural	Nutributter	Improved Package	MMT	Super Cereal	Biofortification and cash transfers
	Urban		Improved Package			Fortification and cash transfers

Figure 80: Daily cost of a nutritious diet for households with intervention packages (CotD Analysis 2017)

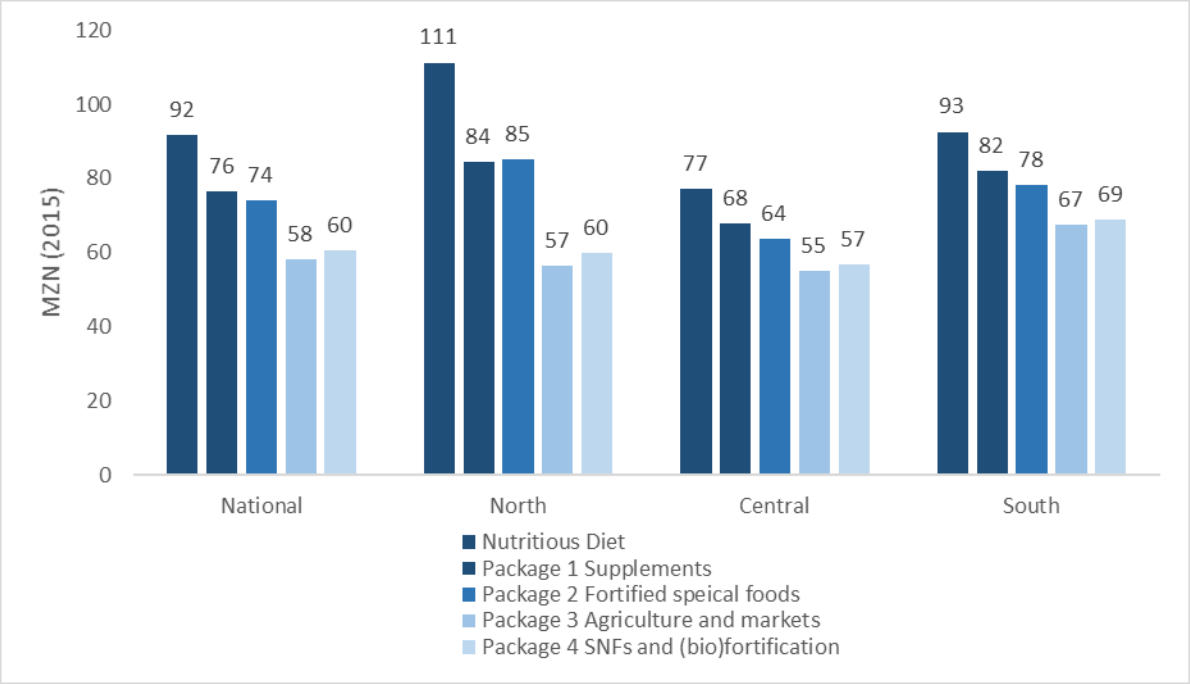


Figure 81: Percentage of households unable to afford a nutritious diet with intervention packages (CotD Analysis 2017)

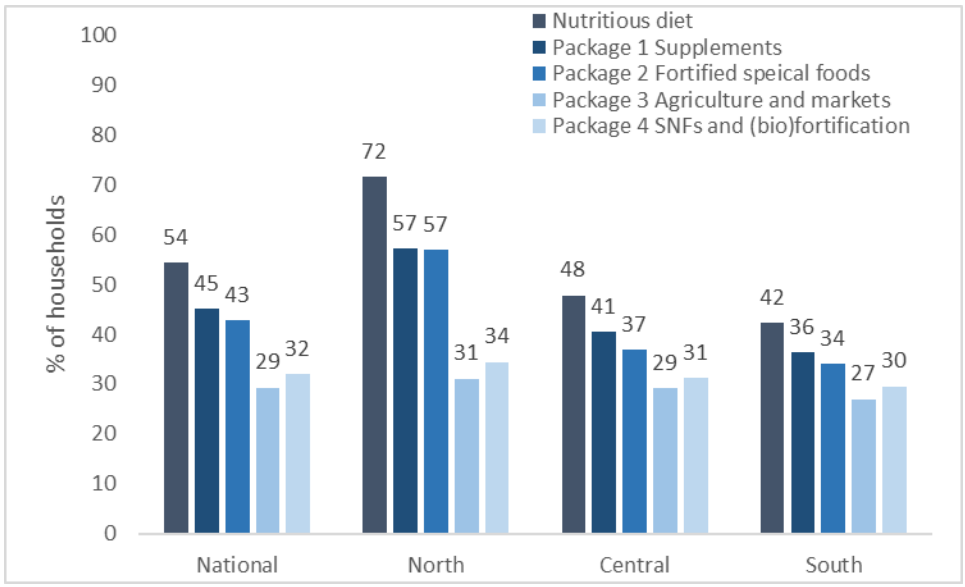
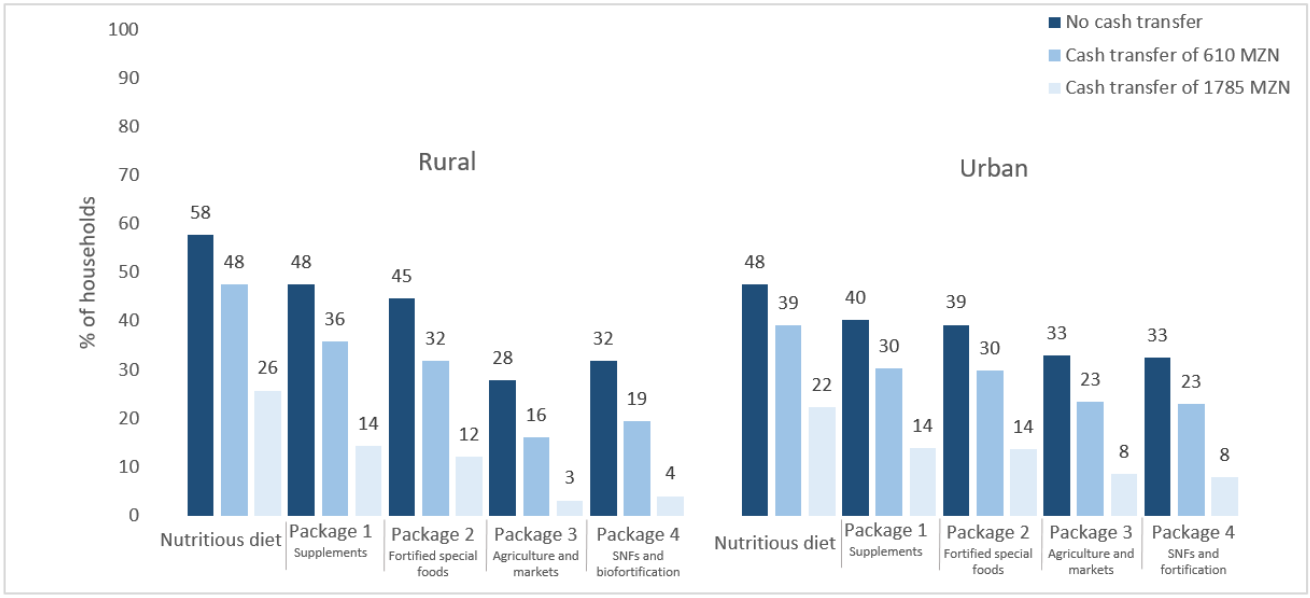


Figure 82: Percentage of households unable to afford a nutritious diet with intervention packages and cash transfers (CotD Analysis 2017)



Nutrition-related policies, programmes and regulatory framework

Key Message 11: Food security and nutrition are stated government priorities across multiple sectors. Targeted and evidence-based strategies are needed to deliver on stated commitments to achieve national food security and nutrition goals.

Food security and nutrition are prioritised by the Government of Mozambique in a number of policy frameworks (see below) and SETSAN is in the process of forming a new National Strategy for Food Security and Nutrition.

The FNG process brought together – and was led by – stakeholders from different government ministries and departments including Health, Agriculture, Food Security and Nutrition, Education and Social Protection. UN agencies, donor agencies and NGOs from different disciplines were also engaged.

A part of this analysis was the ability to show the need for, and potential impact of, packages of interventions delivered by different participants across a range of platforms in different contexts. The FNG process provides evidence for collaboration and targeting of multi-sectoral actions, and clearly demonstrates the responsibility all sectors have for participating in, and contributing to, the improvement of nutrition in Mozambique.

Food security and nutrition are prioritised by the Government of Mozambique in the following policy frameworks:

- Agenda 2025 prioritizes access to food through improved living conditions and human capital (World Food Programme 2017b; Committee of Counsellors 2003)
- The Government of Mozambique's 2015-2019 Five Year Plan includes food security and nutrition in its focus (World Food Programme 2017b; Mozambique 2010)
- The Operational Plan for Agricultural Development 2015-2019 aims to enhance food sovereignty by strengthening value chains, public-private partnerships and farmers' organizations (World Food Programme 2017b; Government of Mozambique 2015)
- The 2013 National School Feeding Programme aims toward including school meals in all pre-primary and primary schools, emphasizing local procurement and nutrition education (World Food Programme 2017b; Government of Mozambique 2016)
- The National Multi-Sectoral Action Plan for the Reduction of Chronic Undernutrition (PAMDRC) 2011-2020 aims to reduce the prevalence of chronic undernutrition to 20% by 2020 (MISAU 2010). The PAMDRC mobilised different sectors from government, civil society, private sector, development agencies and other partners to address the main immediate causes of chronic malnutrition: inadequate nutrient intake, high rates of infectious diseases and early pregnancy (MISAU 2010)
- The National Food Fortification Programme is a government led programme that aims to improve diet quality and micronutrient intake through a mandatory decree for the fortification of: wheat flour with Iron, Folic Acid, complex B vitamins and Zinc; vegetable oil with vitamin A; sugar with vitamins A and D and maize flour with Iron, Folic Acid,

complex B vitamins and Zinc. Salt Iodization has been included under the law although it was already mandatory (World Food Programme 2017b; Instituto Nacional de Normalização e Qualidade 2012)

- Other policies that relate to nutrition by improving the livelihood and resilience of vulnerable households include the National Master Plan for the Prevention and Mitigation of Natural Disasters 2006-2016 and the National Strategy for Basic Social Security II (2016-2024) (World Food Programme 2017b; Conselho de Ministros 2006)

Joint recommendations from dissemination workshops

During the FNG dissemination workshop main findings were shared and discussed. Participants formed working groups by province and by sector. Working groups discussed the following entry points for policy and programmatic strategies: agriculture; social protection; health; SBCC; education; and the private sector. Each group developed action plans for prioritized interventions. Across the action plans and in discussions throughout the workshops the following recommendations emerged from participants.

1.
AGRICULTURE AND FISHERIES — INVEST IN, PROMOTE AND PROLIFERATE THE PRODUCTION OF NUTRITIOUS FOODS AND THE ADOPTION OF IMPROVED TECHNOLOGIES AND METHODS USING COMMUNITY-LEVEL EXTENSION AND SUPPORT.

The average rural household in Mozambique produces 90% of the food it consumes. Dietary diversity and market access are low in most of the country. A consensus was reached among workshop participants that a key intervention would be to support the production of greater quantities of nutritious foods by smallholder farmers. Working groups representing the provinces of Zambezia and Tete highlighted the promotion of beans, green leafy vegetables, eggs and orange-flesh sweet potato in their action plans. A working group representing Nampula and Cabo Delgado provinces highlighted the promotion of biofortified foods in their action plan.

2.
SOCIAL PROTECTION — TARGET THE MOST VULNERABLE GROUPS WITH SOCIAL PROGRAMMES, SUPPORT CASH TRANSFERS WITH SBCC AND INVEST IN IMPROVED DATA SYSTEMS FOR STRUCTURED TARGETING AND MONITORING.

In the preliminary results workshop a group consensus was reached on the importance of targeting the most vulnerable groups in the country in terms of geographical area, poverty status and the lifecycle stage, particularly in development and climate shock responsive settings. In the final results workshop a group representing Nampula developed an action plan combining cash transfers with SBCC to improve consumption of nutritious diets. The group proposed an expansion of ongoing interventions led by INAS and WFP to vulnerable families.

3.

SBCC — PRIORITIZE HARMONIZED SBCC MESSAGES TO IMPROVE DIETS FOR INFANTS AND CHILDREN, WOMEN AND ADOLESCENT GIRLS AT COMMUNITY LEVEL.

Across all interventions and specifically with respect to cash transfers working groups highlighted the importance of SBCC to address existing knowledge gaps in target group populations. The working group from Nampula specifically highlighted the importance of addressing cultural taboos and promoting production of nutritious foods at the household level as a component of a cash transfer programme. Community radio was highlighted as a potential channel.

4.
HEALTH — PROVIDE SERVICES TO PREVENT EARLY PREGNANCIES TO PROTECT ADOLESCENT GIRLS' NUTRITIONAL STATUS AND THAT OF FUTURE GENERATIONS.

CotD analysis identified that of all household members meeting the cost of the nutritious diet was most expensive for adolescent girls, due to high nutrient requirements related to physical development. Early pregnancy was highlighted as an immediate cause of chronic malnutrition in Mozambique. Workshop participants agreed that reducing unwanted teenage pregnancies through the health sector could improve the nutrition situation in Mozambique.

5.
EDUCATION — LEVERAGE SCHOOL FEEDING PROGRAMMES TO IMPROVE ACCESS TO NUTRITIOUS FOODS AND OPTIMISE NUTRITION OUTCOMES.

CotD analysis identified that ongoing school feeding programmes could improve nutrient intake for children if rations were adjusted to include more nutritious foods. Challenges identified by workshop participants in the delivery of more nutritious foods through the school feeding platform included the procurement of fresh foods, food safety and storage, overcoming local taboos and the capacity of programme managers to identify which foods would make rations more nutritious. Workshop participants with experience implementing school feeding programmes agreed that despite the challenges school feeding programmes could be improved to include more nutritious foods and there was a strong commitment to achieving this goal.

6.
PRIVATE SECTOR — ENGAGE WITH THE PRIVATE SECTOR TO SUPPORT AND FACILITATE DEVELOPMENT AND COMMERCIALISATION OF NUTRITIOUS FOODS.

Improved engagement with private sector actors to deliver nutritious foods through commercial channels will be needed to improve nutrient access throughout Mozambique, immediately in urban areas and in the long-run in rural areas. Private sector engagement strategies highlighted by workshop participants included improved enforcement and compliance of fortification standards, promotion and recognition of nutritional options available through private markets, improvement of roads and market access to throughout the country and more production of nutritious foods by Mozambican industry.

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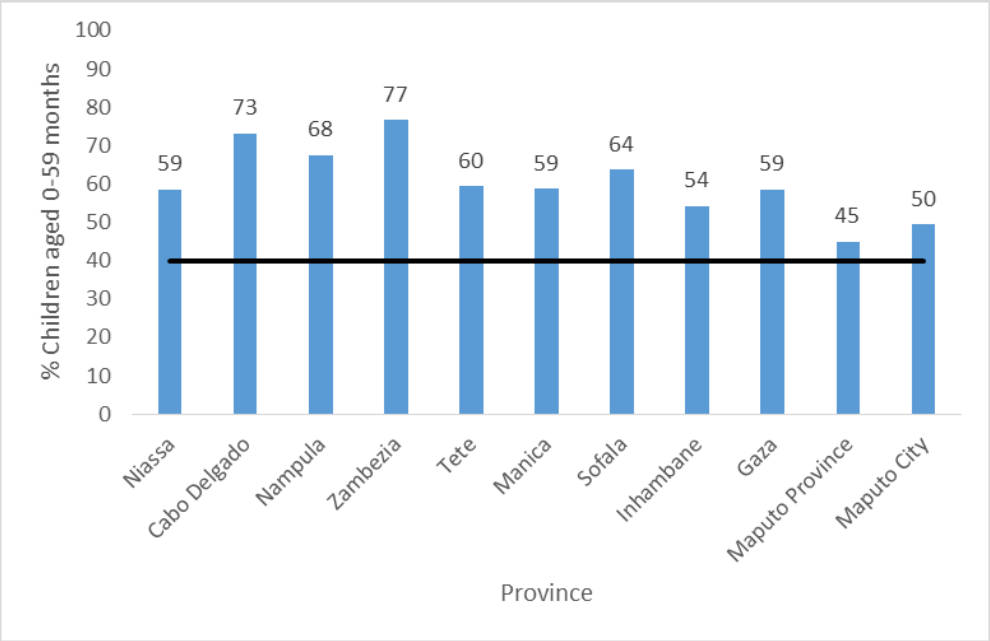
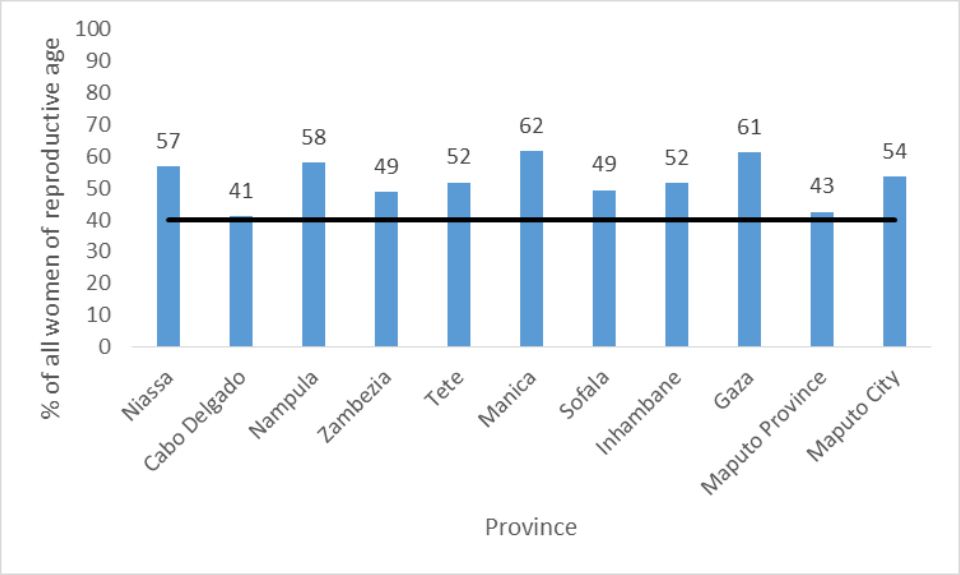
Appendix A: Additional tables and figures

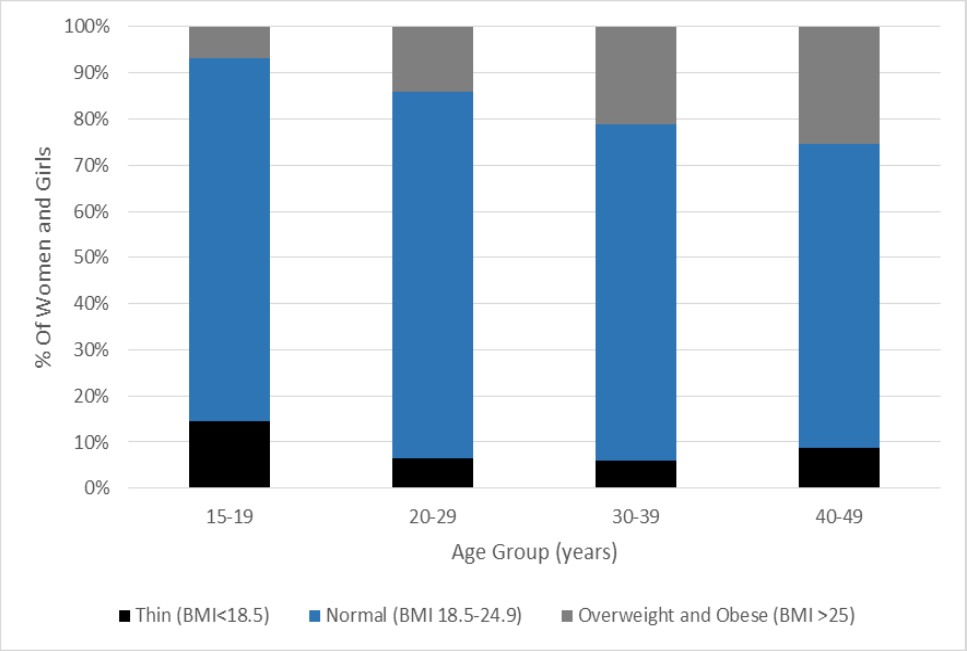
Appendix Figure 1: Prevalence of Anaemia for children aged 0-59 months as per the 2015 DHS preliminary results (line indicates >40% prevalence classified as severe by WHO) (Ministério da Saúde (MISAU) & Instituto Nacional de Estatística (INE) 2015)



Appendix Figure 2: Prevalence of Anaemia for Women of Reproductive Age by Province as per the 2011 DHS (line indicates >40% prevalence classified as severe by WHO) (Instituto Nacional de Estatística (INE) et al. 2013)



Appendix Figure 3: BMI range by age group for adolescent girls and women in Mozambique (national average) as per the 2011 DHS (Instituto Nacional de Estatística (INE) et al. 2013)



Appendix Table 1: Nutrient composition source for CotD analysis

Food Group	Food	Source
Grains and grain-based products	Maize, flour, dry	CotD
	Maize, white, grain or flour	CotD
	Maize, yellow, raw	Kenya
	Millet, flour	Senegal
	Millet, whole grain	Senegal
	Pasta	Mexico
	Rice, white, raw	CotD
	Sorghum, flour	Kenya
	Spaghetti, dry, unenriched	USDA
	Tapioca, pearl, dry	USDA
	Wheat, flour, all purpose, 72% extract	Kenya
	Bread, wheat, white	West Africa
	Sorghum, whole grain, raw	Kenya
Roots and tubers	Beets, raw	USDA
	Potato, English, raw	Kenya
	Sweet potato, raw	Kenya
	Yam, raw	Kenya

	Cassava, flour	West Africa
	Cassava, tuber, raw	West Africa
	Cassava, tuber, dried	West Africa
Legumes, nuts and seeds	Bean, green, CotD	CotD
	Bean, kidney, green, raw	Kenya
	Bean, moth, mature, raw	USDA
	Cowpea, uncooked	Kenya
	Peanut	Egypt
	Pigeon pea, raw	Kenya
	Soybean, raw	Kenya
Meat and offal	Beef, medium fat, raw	Kenya
	Chicken, liver, raw	USDA
	Chicken, raw	Kenya
	Duck, meat, with skin, raw	USDA
	Goat, raw	Kenya
	Pork, meat, raw	USDA
	Pork, sausage	Mexico
	Sausage	Kenya
	Turkey, meat with skin, raw	USDA

	Beef, liver, raw	West Africa
Fish, seafood, amphibians and invertebrates	Clam, raw	USDA
	Crab, sea, raw	Senegal
	Fish, dried, CotD	CotD
	Fish, mackerel, atlantic, raw	USDA
	Fish, raw	Kenya
	Fish, sardine, atlantic, canned in oil, drained	USDA
	Fish, smoked, dried	Senegal
	Oyster, pacific, raw	USDA
	Shrimp, dried	Mexico
	Shrimp, raw	USDA
	Squid, raw	USDA
Eggs and egg products	Egg, whole, raw	USDA
Milk and milk products	Cheese, gouda	USDA
	Milk, condensed, sweetened	USDA
	Milk, cow, fresh, non fortified	Kenya
	Milk, cow, powdered, whole	Kenya
	Yogurt, whole milk	Kenya
Vegetables and vegetable products	Bean, fava, mature, raw	USDA
	Bean, snap, green, raw	USDA

	Cabbage, green or white, raw	Kenya
	Carrot, raw	USDA
	Cucumber, raw	USDA
	Eggplant, raw	USDA
	Leaf, amaranth, raw	USDA
	Leaf, bean, winged, raw	USDA
	Leaf, bitter gourd, raw	USDA
	Leaf, cassava	Kenya
	Leaf, collards, raw	USDA
	Leaf, greens, mustard, raw	USDA
	Leaf, pumpkin	Kenya
	Leaf, sweet potato, raw	USDA
	Lettuce, butter head, raw	USDA
	Mushrooms, white, raw	USDA
	Okra, raw	USDA
	Onion tuber	Kenya
	Pumpkin, raw or cooked	Kenya
	Soybean, green, raw	USDA
	Spinach, raw	USDA
	Squash, zucchini, raw	USDA
Oils and fats	Margarine	Kenya

	Oil, corn	Kenya
	Oil, olive	USDA
Herbs, spices and condiments	Lemon	Kenya
	Tomato, paste	USDA
Fruits and fruit products	Apple, with skin	USDA
	Banana, large, ripe	Kenya
	Coconut, meat	USDA
	Guava	USDA
	Mango	USDA
	Orange	USDA
	Papaya, ripe or unripe	Kenya
	Pineapple	USDA
	Tamarind	USDA
	Tangerine	Kenya
	Tomato, red, ripe, raw	USDA
Supplements and infants foods	Infant cereal, Cerelac	Kenya
	Infant formula, Lactogen	Kenya

Appendix Table 2: IOF 2015 food prices for Cost of the Diet analysis (N/A = food was not available during survey period) (Ministerio de Economia e Finanças 2016)

			Grains and grain-based products (price per 100 g)										
			Bread, wheat, white (Pain, blé, blanc)	Maize, flour, dry	Maize, white, grain or flour	Maize, yellow, raw	Millet, flour	Pasta	Rice, white, raw	Sorghum, flour	Spaghetti, dry, unenriched	Tapioca, pearl, dry	Wheat, flour, all purpose, 72% extract
Cabo Delgado	Rural	Plenty (Feb-Oct)	1.8	3.35	0.68	N/A	N/A	6.9	2.87	N/A	6	N/A	N/A
		Lean (Nov-Jan)	1.8	3.35	0.68	N/A	N/A	6.9	2.87	N/A	6	N/A	N/A
	Urban	Plenty (Feb-Oct)	1.94	N/A	0.72	N/A	N/A	7	2.67	N/A	5.16	N/A	N/A
		Lean (Nov-Jan)	1.94	N/A	0.72	N/A	N/A	7	2.67	N/A	5.16	N/A	N/A
Gaza	Rural	Plenty (Feb-Oct)	2.28	2.17	0.67	N/A	N/A	4	2.71	N/A	4.1	N/A	1.59
		Lean (Nov-Jan)	2.28	2.17	0.67	N/A	N/A	4	2.71	N/A	4.1	N/A	1.59
	Urban	Plenty (Feb-Oct)	2.01	2.76	0.84	N/A	N/A	4	2.54	N/A	4.19	N/A	1.41
		Lean (Nov-Jan)	2.01	2.76	0.84	N/A	N/A	4	2.54	N/A	4.19	N/A	1.41
Inhambane	Rural	Plenty (Feb-Oct)	2.28	2.17	0.67	N/A	N/A	4	2.71	N/A	3	1.8	1.59
		Lean (Nov-Jan)	2.28	2.17	0.67	N/A	N/A	4	2.71	N/A	3	1.8	1.59
	Urban	Plenty (Feb-Oct)	2.01	2.76	0.93	N/A	N/A	4.3	2.54	N/A	4.19	1.7	1.41
		Lean (Nov-Jan)	2.01	2.76	0.93	N/A	N/A	4.3	2.54	N/A	4.19	N/A	1.41
Manica	Rural	Plenty (Feb-Oct)	2.28	2.17	0.67	N/A	N/A	N/A	2.71	N/A	5.6	N/A	1.59
		Lean (Nov-Jan)	2.28	2.17	0.67	3	N/A	N/A	2.71	N/A	4.6	N/A	1.59
	Urban	Plenty (Feb-Oct)	2.01	N/A	0.84	N/A	N/A	5	2.54	N/A	4.19	N/A	1.41
		Lean (Nov-Jan)	2.01	N/A	0.84	N/A	N/A	5	2.54	N/A	4.19	N/A	1.41
Maputo	Rural	Plenty (Feb-Oct)	2.21	2.53	1.33	N/A	N/A	20.3	2.78	N/A	4.5	N/A	N/A
		Lean (Nov-Jan)	2.21	2.53	1.33	N/A	N/A	20.3	2.78	N/A	4.5	N/A	1.55
	Urban	Plenty (Feb-Oct)	2.09	2.82	1.43	N/A	2.8	20.3	2.82	N/A	4.9	1.3	1.46
		Lean (Nov-Jan)	2.09	2.82	1.43	N/A	2.8	20.3	2.82	N/A	4.9	N/A	1.46
Maputo City		Plenty (Feb-Oct)	2.06	N/A	2.68	3	N/A	20.3	2.67	N/A	4.47	1.3	1.44
		Lean (Nov-Jan)	2.06	N/A	2.68	3	N/A	20.3	2.67	N/A	4.47	1.3	1.44

			Roots and tubers (price per 100 g)							Legumes, nuts and seeds (price per 100 g)						
			Beets, raw	Cassava, flour (Manioc, farine)	Cassava, tuber, dried (Manioc, racine, séchée)	Cassava, tuber, raw (Manioc, racine, crue)	Potato, english, raw	Sweet potato, raw	Yam, raw	Bean, green	Bean, kidney, green, raw	Bean, moth, mature, raw	Cowpea, uncooked	Peanut	Pigeon pea, raw	Soybean, raw
Cabo Delgado	Rural	Plenty (Feb-Oct)	N/A	N/A	N/A	1.19	N/A	N/A	N/A	N/A	4	11.6	2.3	3.81	1.85	N/A
		Lean (Nov-Jan)	N/A	N/A	N/A	1.19	N/A	N/A	N/A	N/A	4	N/A	2.3	3.81	1.85	N/A
	Urban	Plenty (Feb-Oct)	N/A	1.65	N/A	1.25	5.7	1.12	N/A	1.45	4.66	N/A	2.9	3.96	2.33	N/A
		Lean (Nov-Jan)	N/A	1.65	N/A	1.25	5.7	N/A	N/A	N/A	4.66	N/A	2.9	3.96	2.33	N/A
Gaza	Rural	Plenty (Feb-Oct)	N/A	N/A	N/A	0.8	3.9	N/A	N/A	N/A	4.63	N/A	2.57	2.89		N/A
		Lean (Nov-Jan)	N/A	N/A	N/A	0.8	3.9	N/A	N/A	N/A	4.63	N/A	2.57	2.89		N/A
	Urban	Plenty (Feb-Oct)	N/A	N/A	N/A	1	3.9	0.78	N/A	N/A	4.87	N/A	3.26	3	1.5	N/A
		Lean (Nov-Jan)	N/A	N/A	N/A	1	3.9	0.78	N/A	N/A	4.87	N/A	N/A	3	N/A	N/A
Inhambane	Rural	Plenty (Feb-Oct)	N/A	N/A	N/A	0.8	3.9	0.74	N/A	N/A	4.63	N/A	2.57	2.81	N/A	N/A
		Lean (Nov-Jan)	N/A	N/A	N/A	0.8	N/A	N/A	N/A	N/A	4.63	N/A	2.57	2.81	N/A	N/A
	Urban	Plenty (Feb-Oct)	N/A	N/A	N/A	0.76	3.9	0.78	N/A	N/A	4.87	N/A	3.26	3	N/A	N/A
		Lean (Nov-Jan)	N/A	N/A	N/A	0.76	3.9	N/A	N/A	N/A	4.87	N/A	N/A	3	N/A	N/A
Manica	Rural	Plenty (Feb-Oct)	N/A	N/A	N/A	1.3	3.9	0.74	1.4	N/A	4.63	N/A	2.57	2.5	2.4	N/A
		Lean (Nov-Jan)	N/A	N/A	N/A	1.3	N/A	N/A	1.4	N/A	4.63	N/A	2.57	2.5	2.4	N/A
	Urban	Plenty (Feb-Oct)	N/A	N/A	N/A	1.5	3.9	0.78	1.33	N/A	4.87	N/A	3.26	2.55	3	N/A
		Lean (Nov-Jan)	N/A	N/A	N/A	1.5	3.9	N/A	1.33	N/A	4.87	N/A	3.26	2.55	N/A	N/A
Maputo	Rural	Plenty (Feb-Oct)	N/A	N/A	N/A	1	4.3	1.45	N/A	4.3	6.06	N/A	3.69	6.14	N/A	N/A
		Lean (Nov-Jan)	3.1	N/A	N/A	1	N/A	1.45	N/A	4.3	6.06	N/A	3.69	6.14	N/A	N/A
	Urban	Plenty (Feb-Oct)	3.6	N/A	N/A	1.42	4.3	1.4	N/A	N/A	6.13	N/A	3.2	6.9	N/A	N/A
		Lean (Nov-Jan)	N/A	N/A	N/A	1.42	4.3	1.4	N/A	N/A	6.13	N/A	3.2	6.9	N/A	N/A
Maputo City		Plenty (Feb-Oct)	3.5	1.35	0.8	1.69	4.3	1.4	N/A	2.46	5.31	N/A	3.21	6.27	1.7	N/A
		Lean (Nov-Jan)	N/A	1.35	0.8	1.69	4.3	1.4	N/A	2.46	5.31	N/A	N/A	6.27	1.7	N/A

			Meat and offal (price per 100g)							
			Beef, liver, raw (Bœuf, foie, cru)	Beef, medium fat, raw	Chicken, liver, raw	Chicken, raw	Goat, raw	Pork, meat, raw	Pork, sausage	Sausage
Cabo Delgado	Rural	Plenty (Feb-Oct)	N/A	N/A	N/A	N/A	N/A	13	N/A	N/A
		Lean (Nov-Jan)	N/A	N/A	N/A	N/A	N/A	13	N/A	N/A
	Urban	Plenty (Feb-Oct)	N/A	N/A	N/A	15.86	13.29	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	N/A	N/A	15.86	13.29	N/A	N/A	N/A
Gaza	Rural	Plenty (Feb-Oct)	N/A	23.7	8	12	N/A	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	23.7	8	12	N/A	N/A	N/A	N/A
	Urban	Plenty (Feb-Oct)	16.2	23.7	7.7	11.85	10.06	9.46	N/A	N/A
		Lean (Nov-Jan)	16.2	23.7	7.7	11.85	10.06	9.46	N/A	N/A
Inhambane	Rural	Plenty (Feb-Oct)	N/A	23.7	N/A	15.37	N/A	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	23.7	N/A	N/A	N/A	N/A	N/A	N/A
	Urban	Plenty (Feb-Oct)	N/A	23.7	7.7	11.85	10.06	9.46	N/A	N/A
		Lean (Nov-Jan)	N/A	23.7	7.7	11.85	10.06	9.46	N/A	N/A
Manica	Rural	Plenty (Feb-Oct)	N/A	23.7	8		10.5	9.5	N/A	N/A
		Lean (Nov-Jan)	N/A	23.7	8		10.5	9.5	N/A	N/A
	Urban	Plenty (Feb-Oct)	16.2	23.7	7.7	11.85	10.06	9.46	N/A	N/A
		Lean (Nov-Jan)	16.2	23.7	7.7	11.85	10.06	9.46	N/A	N/A
Maputo	Rural	Plenty (Feb-Oct)	20.1	35	8	13	N/A	N/A	N/A	21.9
		Lean (Nov-Jan)	20.1	35	8	13	N/A	N/A	N/A	21.9
	Urban	Plenty (Feb-Oct)	20.1	35	7.09	11.56	N/A	9.67	47.3	N/A
		Lean (Nov-Jan)	20.1	35	7.09	11.56	N/A	9.67	47.3	N/A
Maputo City		Plenty (Feb-Oct)	20.1	35	7.15	11.06	N/A	10.1	47.3	21.9
		Lean (Nov-Jan)	20.1	35	7.15	11.06	14.5	10.1	47.3	21.9

			Fish, seafood, amphibians and invertebrates (price per 100g)											
			Clam, raw	Crab, sea, raw	Fish, dried	Fish, mackerel, atlantic, raw	Fish, raw	Fish, sardine, atlantic, canned in oil, drained	Fish, smoked, dried	Oyster, pacific, raw	Shrimp, dried	Shrimp, raw	Squid, raw
Cabo Delgado	Rural	Plenty (Feb-Oct)	N/A	16	9.9	8.1	5.64	N/A	9	N/A	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	16	9.9	8.1	5.64	N/A	9	N/A	N/A	N/A	N/A
	Urban	Plenty (Feb-Oct)	N/A	N/A	8.81	9.03	8.7	N/A	N/A	N/A	N/A	8	N/A
		Lean (Nov-Jan)	N/A	N/A	8.81	9.03	8.7	N/A	N/A	N/A	N/A	8	N/A
Gaza	Rural	Plenty (Feb-Oct)	N/A	N/A	11.15	8.1	3.85	59	N/A	N/A	N/A	9	N/A
		Lean (Nov-Jan)	N/A	N/A	N/A	8.1	3.85	59	N/A	N/A	N/A	9	N/A
	Urban	Plenty (Feb-Oct)	N/A	N/A	11.67	7.18	9.42	59	N/A	N/A	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	N/A	11.67	7.18	9.42	59	N/A	N/A	N/A	N/A	N/A
Inhambane	Rural	Plenty (Feb-Oct)	8	9	11.15	8.5	3.85	59	12	N/A	11	7.5	N/A
		Lean (Nov-Jan)	8	N/A	11.15	8.5	3.85	59	12	N/A	11	7.5	N/A
	Urban	Plenty (Feb-Oct)	9.9	8	11.67	7.18	9.42	59	N/A	13.1	8.7	8.9	18.6
		Lean (Nov-Jan)	9.9	8	11.67	7.18	9.42	59	N/A	13.1	8.7	8.9	18.6
Manica	Rural	Plenty (Feb-Oct)	N/A	N/A	11.15	7.5	3.85	59	N/A	N/A	13.5	N/A	N/A
		Lean (Nov-Jan)	N/A	N/A	11.15	7.5	3.85	59	N/A	N/A	13.5	N/A	N/A
	Urban	Plenty (Feb-Oct)	N/A	N/A	11.67	7.18	9.42	59	N/A	N/A	8	N/A	N/A
		Lean (Nov-Jan)	N/A	N/A	11.67	7.18	N/A	59	N/A	N/A	8	N/A	N/A
Maputo	Rural	Plenty (Feb-Oct)	N/A	N/A	13.4	6.93	4.41	26.1	N/A	N/A	15.3	N/A	N/A
		Lean (Nov-Jan)	N/A	N/A	13.4	6.93	4.41	26.1	N/A	N/A	15.3	N/A	N/A
	Urban	Plenty (Feb-Oct)	N/A	19.2	13	6.45	5.28	26.1	13.07	N/A	15	8.57	N/A
		Lean (Nov-Jan)	N/A	19.2	13	6.45	5.28	26.1	13.07	N/A	15	8.57	N/A
Maputo City		Plenty (Feb-Oct)	N/A	19.2	12	6.13	5.53	26.1	12.5	N/A	13	9.1	16
		Lean (Nov-Jan)	N/A	19.2	12	6.13	5.53	26.1	12.5	N/A	13	9.1	N/A

			Eggs and egg products (price per 100g)	Milk and milk products (price per 100g)				
			Egg, whole, raw	Cheese, gouda	Milk, condensed, sweetened	Milk, cow, fresh, non fortified	Milk, cow, powdered, whole	Yogurt, whole milk
Cabo Delgado	Rural	Plenty (Feb-Oct)	8.7	N/A	N/A	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	N/A	N/A	N/A	N/A	N/A
	Urban	Plenty (Feb-Oct)	8.7	N/A	12.1	N/A	N/A	N/A
		Lean (Nov-Jan)	8.7	N/A	12.1	N/A	N/A	N/A
Gaza	Rural	Plenty (Feb-Oct)	9.1	N/A	N/A	N/A	50.4	N/A
		Lean (Nov-Jan)	9.1	N/A	N/A	N/A	50.4	N/A
	Urban	Plenty (Feb-Oct)	9.1	N/A	10.7	8.1	50.4	N/A
		Lean (Nov-Jan)	9.1	N/A	10.7	8.1	50.4	N/A
Inhambane	Rural	Plenty (Feb-Oct)	9.1	N/A	10.7	N/A	50.4	N/A
		Lean (Nov-Jan)	N/A	N/A	10.7	N/A	50.4	N/A
	Urban	Plenty (Feb-Oct)	9.1	N/A	10.7	N/A	50.4	N/A
		Lean (Nov-Jan)	9.1	N/A	10.7	N/A	50.4	N/A
Manica	Rural	Plenty (Feb-Oct)	9.1	N/A	N/A	N/A	50.4	N/A
		Lean (Nov-Jan)	9.1	N/A	N/A	N/A	50.4	N/A
	Urban	Plenty (Feb-Oct)	9.1	22.3	10.7	8.1	50.4	N/A
		Lean (Nov-Jan)	9.1	22.3	10.7	8.1	50.4	N/A
Maputo	Rural	Plenty (Feb-Oct)	8.2	51	13.3	N/A	44.9	N/A
		Lean (Nov-Jan)	8.2	51	13.3	N/A	44.9	N/A
	Urban	Plenty (Feb-Oct)	9.7	51	13.3	6.8	44.9	18
		Lean (Nov-Jan)	9.7	51	13.3	6.8	44.9	18
Maputo City		Plenty (Feb-Oct)	9.66	51	13.3	6.8	44.9	18
		Lean (Nov-Jan)	9.66	51	13.3	6.8	44.9	18

			Vegetables and vegetable products (price per 100g)									
			Bean, fava, mature, raw	Bean, snap, green, raw	Cabbage, green or white, raw	Carrot, raw	Cucumber, raw	Leaf, amaranth, raw	Leaf, bean, winged, raw	Leaf, bitter gourd, raw	Leaf, cassava	Leaf, collards, raw
Cabo Delgado	Rural	Plenty (Feb-Oct)	2.34	N/A	1.95	N/A	N/A	1.89	2.63	N/A	N/A	1.59
		Lean (Nov-Jan)	N/A	N/A	N/A	N/A	N/A	N/A	2.63	N/A	N/A	N/A
	Urban	Plenty (Feb-Oct)	2	N/A	2.02	N/A	N/A	1.88	3.05	N/A	2.19	1.98
		Lean (Nov-Jan)	N/A	N/A	N/A	N/A	N/A	1.88	3.05	N/A	2.19	N/A
Gaza	Rural	Plenty (Feb-Oct)	N/A	N/A	0.87	4.6	3.1	N/A	1.24	0.9	N/A	1.41
		Lean (Nov-Jan)	N/A	N/A	N/A	4.6	2.1	N/A	1.24	0.9	N/A	N/A
	Urban	Plenty (Feb-Oct)	N/A	3	0.85	4.6	3.1	1.57	2.57	0.91	0.85	1.78
		Lean (Nov-Jan)	N/A	N/A	N/A	4.6	3.1	1.57	2.57	0.91	0.85	N/A
Inhambane	Rural	Plenty (Feb-Oct)	N/A	N/A	0.87	N/A	N/A	1.09	1.24	1.11	1.26	1.41
		Lean (Nov-Jan)	N/A	N/A	N/A	N/A	N/A	1.09	1.24	N/A	1.26	N/A
	Urban	Plenty (Feb-Oct)	N/A	N/A	0.85	4.6	3	1.57	2.57	0.96	0.8	1.78
		Lean (Nov-Jan)	N/A	N/A	N/A	4.6	3	1.57	2.57	0.96	0.8	N/A
Manica	Rural	Plenty (Feb-Oct)	N/A	N/A	0.87	4.6	N/A	1.09	1.24	1.5	1.26	1.41
		Lean (Nov-Jan)	N/A	N/A	N/A	N/A	N/A	1.09	1.24	1.5	1.26	1.41
	Urban	Plenty (Feb-Oct)	N/A	N/A	0.85	4.6	N/A	1.57	2.57	N/A	1.3	1.78
		Lean (Nov-Jan)	N/A	N/A	N/A	4.6	N/A	1.57	2.57	1.7	1.3	1.78
Maputo	Rural	Plenty (Feb-Oct)	N/A	7.9	0.9	7.2	3.6	2.24	2.55	4.58	2.58	1.66
		Lean (Nov-Jan)	N/A	7.9	0.9	7.2	3.6	2.24	2.55	4.58	2.58	1.66
	Urban	Plenty (Feb-Oct)	N/A	7.9	2.26	7.2	3.6	2	2.95	5.31	3.07	2.2
		Lean (Nov-Jan)	N/A	7.9	2.26	7.2	3.6	2	2.95	5.31	3.07	2.2
Maputo City		Plenty (Feb-Oct)	N/A	7.9	2.17	7.2	3.6	1.8	1.7	6.74	1.88	1.9
		Lean (Nov-Jan)	N/A	7.9	2.17	7.2	3.6	1.8	1.7	6.74	1.88	1.9

			Vegetables and vegetable products (price per 100g)									
			Leaf, greens, mustard, raw	Leaf, pumpkin	Leaf, sweet potato, raw	Lettuce, butter head, raw	Mushrooms, white, raw	Okra, raw	Onion tuber	Pumpkin, raw or cooked	Spinach, raw	Squash, zucchini, raw
Cabo Delgado	Rural	Plenty (Feb-Oct)	N/A	3.61	N/A	2.55	N/A	N/A	4.1	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	3.61	N/A	N/A	N/A	N/A	4.1	N/A	N/A	N/A
	Urban	Plenty (Feb-Oct)	N/A	3.11	N/A	2.6	N/A	2.3	3.98	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	3.11	N/A	N/A	N/A	2.3	3.98	N/A	N/A	N/A
Gaza	Rural	Plenty (Feb-Oct)	N/A	1.65	1.18	2.1	N/A	2.19	3.58	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	1.65	N/A	N/A	N/A	2.19	3.58	N/A	N/A	N/A
	Urban	Plenty (Feb-Oct)	N/A	2	1.2	1.88	N/A	3.58	4.01	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	2	1.2	N/A	N/A	3.58	4.01	N/A	N/A	N/A
Inhambane	Rural	Plenty (Feb-Oct)	N/A	1.65	N/A	2.1	N/A	N/A	1	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	N/A	N/A	N/A	N/A	N/A	1	N/A	N/A	N/A
	Urban	Plenty (Feb-Oct)	N/A	2	1.2	2	N/A	N/A	4.01	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	2	N/A	2	N/A	N/A	4.01	N/A	N/A	N/A
Manica	Rural	Plenty (Feb-Oct)	1.26	1.65	2	2.5	N/A	2.19	3.4	N/A	N/A	N/A
		Lean (Nov-Jan)	1.26	1.65	N/A	N/A	N/A	2.19	3.4	N/A	N/A	N/A
	Urban	Plenty (Feb-Oct)	1.2	2	1.2	2.9	N/A	3.58	4.01	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	2	1.2	2.9	N/A	3.58	4.01	N/A	N/A	N/A
Maputo	Rural	Plenty (Feb-Oct)	N/A	2.08	2.15	2.59	N/A	N/A	3.33	3.5	N/A	3.5
		Lean (Nov-Jan)	N/A	2.08	2.15	2.59	N/A	N/A	3.33	3.5	N/A	3.5
	Urban	Plenty (Feb-Oct)	N/A	2.47	2	3.13	N/A	3.67	3.82	N/A	2	N/A
		Lean (Nov-Jan)	N/A	2.47	2	3.13	N/A	3.67	3.82	N/A	N/A	N/A
Maputo City		Plenty (Feb-Oct)	N/A	3.02	2	2.3	N/A	3.12	3.14	N/A	1.9	N/A
		Lean (Nov-Jan)	N/A	3.02	2	2.3	N/A	3.12	3.14	N/A	N/A	N/A

			Fruits and fruit products (price per 100g)										
			Apple, with skin	Banana, large, ripe	Coconut, meat	Guava	Mango	Orange	Papaya, ripe or unripe	Pineapple	Tamarind	Tangerine	Tomato, red, ripe, raw
Cabo Delgado	Rural	Plenty (Feb-Oct)	N/A	1.4	N/A	N/A	N/A	N/A	2.7	N/A	N/A	N/A	2.59
		Lean (Nov-Jan)	N/A	1.4	1.6	N/A	1.28	N/A	2.7	N/A	N/A	N/A	2.59
	Urban	Plenty (Feb-Oct)	N/A	1.4	1.74	N/A	1.5	3.9	2.7	N/A	N/A	N/A	2.83
		Lean (Nov-Jan)	N/A	N/A	1.74	N/A	1.5	N/A	N/A	N/A	N/A	N/A	2.83
Gaza	Rural	Plenty (Feb-Oct)	N/A	2.4	1.34	N/A	N/A	1.7	N/A	N/A	N/A	N/A	1.86
		Lean (Nov-Jan)	N/A	2.4	1.34	N/A	0.69	N/A	N/A	N/A	N/A	N/A	1.86
	Urban	Plenty (Feb-Oct)	N/A	2.4	1.4	N/A	N/A	1.8	2.8	N/A	N/A	N/A	1.94
		Lean (Nov-Jan)	N/A	N/A	1.4	N/A	N/A	N/A	2.8	N/A	N/A	N/A	1.94
Inhambane	Rural	Plenty (Feb-Oct)	N/A	2.4	1.14	N/A	0.69	1.26	N/A	2.5	7	N/A	1.86
		Lean (Nov-Jan)	N/A	2.4	1.14	N/A	0.69	N/A	N/A	2.5	7	N/A	1.86
	Urban	Plenty (Feb-Oct)	N/A	2.4	1.3	N/A	N/A	1.6	N/A	N/A	N/A	N/A	1.94
		Lean (Nov-Jan)	N/A	2.4	N/A	N/A	0.98	N/A	N/A	N/A	N/A	N/A	1.94
Manica	Rural	Plenty (Feb-Oct)	N/A	2.4	1.1	N/A	N/A	1.6	N/A	N/A	N/A	N/A	1.86
		Lean (Nov-Jan)	N/A	2.4	1.1	N/A	0.69	N/A	N/A	N/A	N/A	N/A	1.86
	Urban	Plenty (Feb-Oct)	4	2.4	1.15	N/A	N/A	1.6	N/A	N/A	N/A	2.5	1.94
		Lean (Nov-Jan)	4	2.4	1.15	N/A	1.5	N/A	N/A	N/A	N/A	N/A	1.94
Maputo	Rural	Plenty (Feb-Oct)	N/A	3.4	1.5	N/A	N/A	4.8	6.2	N/A	N/A	N/A	2.85
		Lean (Nov-Jan)	N/A	3.4	N/A	N/A	2.04	4.8	6.2	N/A	N/A	N/A	2.85
	Urban	Plenty (Feb-Oct)	8.1	3.4	1.29	N/A	N/A	4.8	6.2	N/A	N/A	2.5	3.23
		Lean (Nov-Jan)	N/A	3.4	1.29	3	2.5	4.8	N/A	3.8	N/A	N/A	3.23
Maputo City		Plenty (Feb-Oct)	8.1	3.4	1.12	N/A	N/A	4.8	6.2	3.8	3	2.1	2.33
		Lean (Nov-Jan)	N/A	3.4	1.12	2.3	2	N/A	6.2	3.8	N/A	N/A	2.33

			Oils and fats (price per 100g)			Herbs, spices and condiments (price per 100g)
			Margarine	Oil, corn	Oil, olive	Lemon
Cabo Delgado	Rural	Plenty (Feb-Oct)	N/A	7.67	N/A	6.5
		Lean (Nov-Jan)	N/A	7.67	N/A	6.5
	Urban	Plenty (Feb-Oct)	22.2	6.15	N/A	6.5
		Lean (Nov-Jan)	22.2	6.15	N/A	N/A
Gaza	Rural	Plenty (Feb-Oct)	28.4	6.7	N/A	4.2
		Lean (Nov-Jan)	28.4	6.7	N/A	N/A
	Urban	Plenty (Feb-Oct)	29.4	5.93	N/A	4.2
		Lean (Nov-Jan)	29.4	5.93	N/A	N/A
Inhambane	Rural	Plenty (Feb-Oct)	28.4	6.7	N/A	N/A
		Lean (Nov-Jan)	28.4	6.7	N/A	N/A
	Urban	Plenty (Feb-Oct)	29.4	5.93	N/A	4.2
		Lean (Nov-Jan)	29.4	5.93	N/A	N/A
Manica	Rural	Plenty (Feb-Oct)	N/A	6.7	N/A	4.2
		Lean (Nov-Jan)	N/A	6.7	N/A	N/A
	Urban	Plenty (Feb-Oct)	29.4	5.93	N/A	4.2
		Lean (Nov-Jan)	29.4	5.93	N/A	N/A
Maputo	Rural	Plenty (Feb-Oct)	35.6	6.5	N/A	5.2
		Lean (Nov-Jan)	35.6	6.5	N/A	5.2
	Urban	Plenty (Feb-Oct)	35.6	7.02	N/A	5.2
		Lean (Nov-Jan)	35.6	7.02	N/A	5.2
Maputo City		Plenty (Feb-Oct)	35.6	7.05	40.2	5.2
		Lean (Nov-Jan)	35.6	7.05	40.2	N/A

			Grains and grain-based products (price per 100 g)										
			Bread, wheat, white (Pain, blé, blanc)	Maize, flour, dry	Maize, white, grain or flour	Maize, yellow, raw	Millet, flour	Pasta	Rice, white, raw	Sorghum, flour	Spaghetti, dry, unenriched	Tapioca, pearl, dry	Wheat, flour, all purpose, 72% extract
Nampula	Rural	Plenty (Feb-Oct)	1.6	1.54	0.6	N/A	N/A	N/A	2.59	N/A	5	N/A	N/A
		Lean (Nov-Jan)	1.6	1.54	0.6	N/A	N/A	N/A	2.59	N/A	5	N/A	N/A
	Urban	Plenty (Feb-Oct)	1.73	1.79	0.62	N/A	N/A	N/A	2.36	N/A	4.37	N/A	1.21
		Lean (Nov-Jan)	1.73	1.79	0.62	N/A	N/A	N/A	2.36	N/A	4.37	N/A	1.21
Niassa	Rural	Plenty (Feb-Oct)	1.9	3.4	0.7	N/A	N/A	6.9	2.9	N/A	5.2	N/A	N/A
		Lean (Nov-Jan)	1.9	3.4	0.7	N/A	N/A	6.9	2.9	N/A	N/A	N/A	N/A
	Urban	Plenty (Feb-Oct)	1.94	2.76	0.68	N/A	N/A	7.1	2.67	N/A	5.16	N/A	1.36
		Lean (Nov-Jan)	1.94	2.76	0.68	N/A	N/A	7.1	2.67	N/A	5.16	N/A	1.36
Sofala	Rural	Plenty (Feb-Oct)	1.8	1.67	0.75	2.7	N/A	13.7	2.18	N/A	3.9	N/A	N/A
		Lean (Nov-Jan)	1.8	1.67	0.75	N/A	N/A	13.7	2.18	N/A	3.9	N/A	N/A
	Urban	Plenty (Feb-Oct)	1.69	1.71	0.87	N/A	N/A	4.7	2.43	N/A	4.1	N/A	1.18
		Lean (Nov-Jan)	1.69	1.71	0.87	N/A	N/A	4.7	2.43	N/A	4.1	N/A	1.18
Tete	Rural	Plenty (Feb-Oct)	2.28	N/A	0.67	N/A	N/A	N/A	2.71	N/A	5	N/A	N/A
		Lean (Nov-Jan)	2.28	N/A	0.67	N/A	N/A	N/A	2.71	N/A	5	N/A	N/A
	Urban	Plenty (Feb-Oct)	2.01	2.76	0.84	N/A	N/A	N/A	2.54	N/A	4.19	N/A	1.41
		Lean (Nov-Jan)	2.01	2.76	0.84	N/A	N/A	N/A	2.54	N/A	4.19	N/A	1.41
Zambezia	Rural	Plenty (Feb-Oct)	1.7	1.67	0.75	N/A	N/A	N/A	2.18	N/A	4	N/A	N/A
		Lean (Nov-Jan)	1.7	1.67	0.75	N/A	N/A	N/A	2.18	N/A	4	N/A	N/A
	Urban	Plenty (Feb-Oct)	1.69	1.71	0.87	N/A	N/A	N/A	2.43	0.87	5	N/A	1.18
		Lean (Nov-Jan)	1.69	1.71	0.87	N/A	N/A	N/A	2.43	N/A	5	N/A	1.18

			Roots and tubers (price per 100 g)							Legumes, nuts and seeds (price per 100 g)						
			Beets, raw	Cassava, flour (Manioc, farine)	Cassava, tuber, dried (Manioc, racine, séchée)	Cassava, tuber, raw (Manioc, racine, crue)	Potato, english, raw	Sweet potato, raw	Yam, raw	Bean, green	Bean, kidney, green, raw	Bean, moth, mature, raw	Cowpea, uncooked	Peanut	Pigeon pea, raw	Soybean, raw
Nampula	Rural	Plenty (Feb-Oct)	N/A	1.1	0.9	0.74	5.7	0.86	N/A	N/A	4.5	N/A	1.27	3.21	1.31	N/A
		Lean (Nov-Jan)	N/A	1.1	0.9	0.74	N/A	N/A	N/A	N/A	N/A	N/A	1.27	3.21	1.31	N/A
	Urban	Plenty (Feb-Oct)	N/A	1.21	0.74	1.19	5.7	1.14	1	N/A	5.23	11.6	1.88	3.15	1.8	N/A
		Lean (Nov-Jan)	N/A	1.21	0.74	1.19	5.7	N/A	1	N/A	5.23	11.6	1.88	3.15	1.8	N/A
Niassa	Rural	Plenty (Feb-Oct)	N/A	1.7	0.9	1.2	5.7	1.1	N/A	N/A	4	11.6	N/A	3.8	N/A	N/A
		Lean (Nov-Jan)	N/A	1.7	0.9	1.2	N/A	N/A	N/A	N/A	4	11.6	2.3	N/A	1.9	N/A
	Urban	Plenty (Feb-Oct)	N/A	1.65	0.95	1.22	5.7	1.12	N/A	1.5	4.66	11.6	2.9	3.96	2.33	N/A
		Lean (Nov-Jan)	N/A	1.65	0.95	1.22	N/A	N/A	N/A	N/A	4.66	11.6	N/A	N/A	2.33	N/A
Sofala	Rural	Plenty (Feb-Oct)	N/A	N/A	0.9	0.52	3.9	0.5	N/A	N/A	3.67	N/A	2.18	2.6	1.4	N/A
		Lean (Nov-Jan)	N/A	N/A	N/A	0.52	N/A	0.5	N/A	N/A	3.67	N/A	2.18	2.6	1.4	N/A
	Urban	Plenty (Feb-Oct)	N/A	N/A	0.85	0.72	3.9	0.69	3	N/A	4.39	N/A	3	2.7	1.45	1.54
		Lean (Nov-Jan)	N/A	N/A	0.85	0.72	3.9	0.69	3	N/A	4.39	N/A	3	2.7	1.45	1.54
Tete	Rural	Plenty (Feb-Oct)	N/A	N/A	0.8	0.8	3.9	0.74	N/A	N/A	4.63	4	2.57	3.5	2.4	N/A
		Lean (Nov-Jan)	N/A	N/A	0.8	0.8	3.9	N/A	1.05	N/A	4.63	N/A	2.57	3.5	2.4	N/A
	Urban	Plenty (Feb-Oct)	N/A	N/A	N/A	0.88	3.9	0.78	N/A	N/A	4.87	2	3.26	2.4	2.45	N/A
		Lean (Nov-Jan)	N/A	N/A	N/A	0.88	3.9	N/A	N/A	N/A	4.87	N/A	N/A	2.4	2.45	N/A
Zambezia	Rural	Plenty (Feb-Oct)	N/A	1.53	N/A	0.52	3.9	0.5	N/A	N/A	3.67	N/A	2.18	3.5	1.4	N/A
		Lean (Nov-Jan)	N/A	1.53	N/A	0.52	N/A	0.5	N/A	N/A	3.67	N/A	2.18	3.5	1.4	N/A
	Urban	Plenty (Feb-Oct)	N/A	2.5	N/A	0.72	3.9	0.69	1.1	N/A	4.39	N/A	3	3.4	1.45	N/A
		Lean (Nov-Jan)	N/A	2.5	N/A	0.72	3.9	0.69	1.1	N/A	4.39	N/A	3	3.4	1.45	N/A

			Meat and offal (price per 100g)							
			Beef, liver, raw (Bœuf, foie, cru)	Beef, medium fat, raw	Chicken, liver, raw	Chicken, raw	Goat, raw	Pork, meat, raw	Pork, sausage	Sausage
Nampula	Rural	Plenty (Feb-Oct)	N/A	N/A	N/A	N/A	12	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	N/A	N/A	N/A	12	N/A	N/A	N/A
	Urban	Plenty (Feb-Oct)	N/A	35.5	N/A	14.31	14.46	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	35.5	N/A	14.31	14.46	N/A	N/A	N/A
Niassa	Rural	Plenty (Feb-Oct)	13	35.5	N/A	N/A	14	N/A	N/A	21.7
		Lean (Nov-Jan)	13	35.5	N/A	N/A	14	N/A	N/A	21.7
	Urban	Plenty (Feb-Oct)	13	35.5	N/A	15.86	13.29	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	35.5	N/A	15.86	13.29	N/A	N/A	N/A
Sofala	Rural	Plenty (Feb-Oct)	N/A	23.7	N/A	8.7	10.7	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	23.7	N/A	8.7	N/A	9.7	N/A	N/A
	Urban	Plenty (Feb-Oct)	23.7	N/A	12	9.5	11	10	N/A	N/A
		Lean (Nov-Jan)	23.7	N/A	12	9.5	11	N/A	N/A	N/A
Tete	Rural	Plenty (Feb-Oct)	N/A	N/A	N/A	N/A	N/A	10	N/A	N/A
		Lean (Nov-Jan)	N/A	N/A	N/A	N/A	N/A	10	N/A	N/A
	Urban	Plenty (Feb-Oct)	16.2	23.7	7.7	11.85	10.06	9.46	N/A	N/A
		Lean (Nov-Jan)	16.2	23.7	7.7	11.85	10.06	9.46	N/A	N/A
Zambezia	Rural	Plenty (Feb-Oct)	N/A	N/A	N/A	N/A	N/A	9	N/A	N/A
		Lean (Nov-Jan)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Urban	Plenty (Feb-Oct)	16.2	23.7	N/A	15	15	10	N/A	N/A
		Lean (Nov-Jan)	16.2	23.7	N/A	15	15	N/A	N/A	N/A

			Fish, seafood, amphibians and invertebrates (price per 100g)										
			Clam, raw	Crab, sea, raw	Fish, dried	Fish, mackerel, atlantic, raw	Fish, raw	Fish, sardine, atlantic, canned in oil, drained	Fish, smoked, dried	Oyster, pacific, raw	Shrimp, dried	Shrimp, raw	Squid, raw
Nampula	Rural	Plenty (Feb-Oct)	N/A	16	11.4	8.5	5.23	N/A	9	N/A	9	7	N/A
		Lean (Nov-Jan)	N/A	16	11.4	8.5	5.23	N/A	9	N/A	9	7	N/A
	Urban	Plenty (Feb-Oct)	N/A	N/A	12.21	8.22	8.48	23.2	9	N/A	10.83	9.06	18
		Lean (Nov-Jan)	N/A	N/A	12.21	8.22	8.48	23.2	9	N/A	10.83	9.06	18
Niassa	Rural	Plenty (Feb-Oct)	N/A	N/A	9.9	9.5	5.6	23.2	9.9	N/A	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	N/A	9.9	N/A	5.6	23.2	N/A	N/A	N/A	N/A	N/A
	Urban	Plenty (Feb-Oct)	N/A	N/A	8.81	9.03	8.7	23.2	N/A	N/A	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	N/A	8.81	9.03	8.7	23.2	N/A	N/A	N/A	N/A	N/A
Sofala	Rural	Plenty (Feb-Oct)	N/A	N/A	9.46	9.7	3.55	59	N/A	N/A	7.36	9.8	N/A
		Lean (Nov-Jan)	N/A	N/A	9.46	9.7	3.55	59	N/A	N/A	7.36	9.8	N/A
	Urban	Plenty (Feb-Oct)	N/A	N/A	10.06	7.02	5.5	59	N/A	N/A	12.99	6.43	N/A
		Lean (Nov-Jan)	N/A	N/A	10.06	7.02	5.5	59	N/A	N/A	12.99	6.43	N/A
Tete	Rural	Plenty (Feb-Oct)	N/A	N/A	11.15	N/A	N/A	59	9	N/A	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	N/A	11.15	N/A	N/A	59	9	N/A	N/A	N/A	N/A
	Urban	Plenty (Feb-Oct)	N/A	N/A	11.67	7.18	9.42	59	7.9	N/A	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	N/A	11.67	7.18	9.42	59	7.9	N/A	N/A	N/A	N/A
Zambezia	Rural	Plenty (Feb-Oct)	N/A	N/A	9.46	8	3.55	59	N/A	N/A	7.36	9.5	N/A
		Lean (Nov-Jan)	N/A	N/A	9.46	N/A	3.55	59	N/A	N/A	7.36	9.5	N/A
	Urban	Plenty (Feb-Oct)	N/A	15	10.06	7.02	5.5	59	N/A	N/A	12.99	6.43	18.6
		Lean (Nov-Jan)	N/A	15	10.06	7.02	5.5	59	10	N/A	12.99	6.43	18.6

			Eggs and egg products (price per 100g)	Milk and milk products (price per 100g)				
			Egg, whole, raw	Cheese, gouda	Milk, condensed, sweetened	Milk, cow, fresh, non fortified	Milk, cow, powdered, whole	Yogurt, whole milk
Nampula	Rural	Plenty (Feb-Oct)	8.7	N/A	N/A	N/A	N/A	N/A
		Lean (Nov-Jan)	8.7	N/A	N/A	N/A	N/A	N/A
	Urban	Plenty (Feb-Oct)	8.7	N/A	12.1	N/A	N/A	N/A
		Lean (Nov-Jan)	8.7	N/A	12.1	N/A	N/A	N/A
Niassa	Rural	Plenty (Feb-Oct)	8.7	N/A	N/A	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	N/A	N/A	N/A	N/A	N/A
	Urban	Plenty (Feb-Oct)	8.7	N/A	12.1	10	51.2	22
		Lean (Nov-Jan)	8.7	N/A	N/A	10	N/A	N/A
Sofala	Rural	Plenty (Feb-Oct)	9.1	N/A	N/A	N/A	N/A	N/A
		Lean (Nov-Jan)	9.1	N/A	N/A	N/A	N/A	N/A
	Urban	Plenty (Feb-Oct)	9.1	N/A	N/A	N/A	50.4	N/A
		Lean (Nov-Jan)	9.1	N/A	N/A	N/A	50.4	N/A
Tete	Rural	Plenty (Feb-Oct)	9.1	N/A	N/A	N/A	50.4	N/A
		Lean (Nov-Jan)	9.1	N/A	N/A	N/A	50.4	N/A
	Urban	Plenty (Feb-Oct)	9.1	N/A	10.7	8.1	50.4	N/A
		Lean (Nov-Jan)	9.1	N/A	10.7	N/A	50.4	N/A
Zambezia	Rural	Plenty (Feb-Oct)	9.1	N/A	N/A	N/A	N/A	N/A
		Lean (Nov-Jan)	9.1	N/A	N/A	N/A	N/A	N/A
	Urban	Plenty (Feb-Oct)	9.1	N/A	10.7	8.1	50.4	N/A
		Lean (Nov-Jan)	9.1	N/A	10.7	N/A	50.4	N/A

			Vegetables and vegetable products (price per 100g)									
			Bean, fava, mature, raw	Bean, snap, green, raw	Cabbage, green or white, raw	Carrot, raw	Cucumber, raw	Leaf, amaranth, raw	Leaf, bean, winged, raw	Leaf, bitter gourd, raw	Leaf, cassava	Leaf, collards, raw
Nampula	Rural	Plenty (Feb-Oct)	1.17	N/A	1.8		N/A	1.12	2.4	N/A		1.7
		Lean (Nov-Jan)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Urban	Plenty (Feb-Oct)	1.4	N/A	2.04	7.6	N/A	1.3	2.37	N/A	1.42	2.01
		Lean (Nov-Jan)	N/A	N/A	N/A	N/A	N/A	1.3	2.37	N/A	1.42	N/A
Niassa	Rural	Plenty (Feb-Oct)	N/A	N/A	1.8	7.6	N/A	1.9	N/A	N/A	2.7	1.6
		Lean (Nov-Jan)	2.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.6
	Urban	Plenty (Feb-Oct)	N/A	N/A	2.1	7.6	N/A	1.88	1.9	N/A	2.19	1.98
		Lean (Nov-Jan)	N/A	N/A	N/A	7.6	N/A	N/A	1.9	N/A	2.19	1.98
Sofala	Rural	Plenty (Feb-Oct)	N/A	N/A	0.9	N/A	N/A	1.25	1.33	1.28	1.26	1.6
		Lean (Nov-Jan)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.26	N/A
	Urban	Plenty (Feb-Oct)	N/A	N/A	0.67	4.6	N/A	1.2	1.2	1.5	1.73	2.76
		Lean (Nov-Jan)	N/A	N/A	N/A	4.6	N/A	N/A	1.2	1.5	1.73	2.76
Tete	Rural	Plenty (Feb-Oct)	N/A	N/A	0.87	4.6	N/A	1.09	1.24	N/A	1.26	1.41
		Lean (Nov-Jan)	N/A	N/A	N/A	N/A	N/A	1.09	1.24	N/A	1.26	N/A
	Urban	Plenty (Feb-Oct)	N/A	N/A	0.85	4.6	N/A	1.57	2.57	N/A	1.2	1.78
		Lean (Nov-Jan)	N/A	N/A	0.85	4.6	N/A	1.57	2.57	N/A	1.2	1.78
Zambezia	Rural	Plenty (Feb-Oct)	N/A	N/A	1.77	4.6	N/A	N/A	N/A	N/A	1.26	1.8
		Lean (Nov-Jan)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.26	N/A
	Urban	Plenty (Feb-Oct)	N/A	N/A	2.8	4.6	N/A	1.4	2.4	N/A	1.73	2.76
		Lean (Nov-Jan)	N/A	N/A	N/A	4.6	N/A	1.4	2.4	N/A	1.73	N/A

			Vegetables and vegetable products (price per 100g)									
			Leaf, greens, mustard, raw	Leaf, pumpkin	Leaf, sweet potato, raw	Lettuce, butter head, raw	Mushrooms, white, raw	Okra, raw	Onion tuber	Pumpkin, raw or cooked	Spinach, raw	Squash, zucchini, raw
Nampula	Rural	Plenty (Feb-Oct)	N/A	2.13	1.83	N/A	N/A	3	4	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	N/A	N/A	N/A	N/A	N/A	4	N/A	N/A	N/A
	Urban	Plenty (Feb-Oct)	N/A	2.5	1.6	2.5	N/A	2.4	4.54	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	N/A	1.6	N/A	N/A	2.4	4.54	N/A	N/A	N/A
Niassa	Rural	Plenty (Feb-Oct)	N/A	3.6	N/A	2.5	N/A	N/A	3.6	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	3.6	N/A	N/A	N/A	N/A	3.6	N/A	N/A	N/A
	Urban	Plenty (Feb-Oct)	N/A	3.11	1.72	2.6	N/A	3	3.98	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	3.11	1.72	N/A	N/A	3	3.98	N/A	N/A	N/A
Sofala	Rural	Plenty (Feb-Oct)	N/A	1.38	1.44	1.2	N/A	2.38	3.5	2.5	N/A	2.5
		Lean (Nov-Jan)	N/A	1.38	N/A	N/A	N/A	2.38	3.5	N/A	N/A	N/A
	Urban	Plenty (Feb-Oct)	N/A	2.2	1.69	2.54	N/A	3.4	0.64	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	2.2	N/A	N/A	N/A	3.4	0.64	N/A	N/A	N/A
Tete	Rural	Plenty (Feb-Oct)	N/A	1.65	1.8	2.7	7	2.19	3.5	2.5	N/A	2.5
		Lean (Nov-Jan)	N/A	1.65	1.8	N/A	7	N/A	3.5	N/A	N/A	N/A
	Urban	Plenty (Feb-Oct)	N/A	2	1.77	2.3	N/A	3.58	4.01	N/A	N/A	N/A
		Lean (Nov-Jan)	N/A	2	N/A	N/A	N/A	3.58	4.01	N/A	N/A	N/A
Zambezia	Rural	Plenty (Feb-Oct)	N/A	1.38	N/A	N/A	N/A	2.38	4.5	3	N/A	3
		Lean (Nov-Jan)	N/A	1.38	N/A	N/A	N/A	2.38	4.5	3	N/A	3
	Urban	Plenty (Feb-Oct)	N/A	2.2	1.69	2.2	N/A	3	4.6	2.5	N/A	2.5
		Lean (Nov-Jan)	N/A	2.2	1.69	N/A	N/A	3	4.6	N/A	N/A	N/A

			Fruits and fruit products (price per 100g)										
			Apple, with skin	Banana, large, ripe	Coconut, meat	Guava	Mango	Orange	Papaya, ripe or unripe	Pineapple	Tamarind	Tangerine	Tomato, red, ripe, raw
Nampula	Rural	Plenty (Feb-Oct)	N/A	1.49	1.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.12
		Lean (Nov-Jan)	N/A	N/A	1.6	N/A	1.3	N/A	N/A	N/A	N/A	N/A	2.12
	Urban	Plenty (Feb-Oct)	N/A	2.11	1.23	N/A	N/A	3.9	N/A	N/A	N/A	N/A	3.25
		Lean (Nov-Jan)	N/A	2.11	1.23	N/A	1.35	N/A	N/A	N/A	N/A	N/A	3.25
Niassa	Rural	Plenty (Feb-Oct)	N/A	1.4	N/A	N/A	N/A	3.9	N/A	3	N/A	N/A	2.6
		Lean (Nov-Jan)	N/A	N/A	N/A	N/A	1.3	N/A	N/A	N/A	N/A	N/A	2.6
	Urban	Plenty (Feb-Oct)	N/A	1.4	1.74	N/A	N/A	3.9	2.8	N/A	N/A	N/A	2.83
		Lean (Nov-Jan)	N/A	N/A	1.74	N/A	1.33	N/A	N/A	N/A	N/A	N/A	2.83
Sofala	Rural	Plenty (Feb-Oct)	N/A	2.4	N/A	N/A	N/A	1.67	2.8	2.5	N/A	N/A	1.79
		Lean (Nov-Jan)	N/A	2.4	N/A	N/A	0.78	N/A	N/A	N/A	N/A	N/A	1.79
	Urban	Plenty (Feb-Oct)	N/A	2.4	0.98	N/A	N/A	1.55	N/A	2.5	N/A	N/A	2.66
		Lean (Nov-Jan)	N/A	N/A	0.98	N/A	0.55	N/A	N/A	2.5	N/A	N/A	2.66
Tete	Rural	Plenty (Feb-Oct)	N/A	2.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.86
		Lean (Nov-Jan)	N/A	2.4	N/A	N/A	0.69	N/A	N/A	N/A	N/A	N/A	1.86
	Urban	Plenty (Feb-Oct)	N/A	2.4	1.2	N/A	N/A	1.5	N/A	2.5	N/A	N/A	1.94
		Lean (Nov-Jan)	N/A	2.4	1.2	N/A	0.98	N/A	N/A	2.5	N/A	N/A	1.94
Zambezia	Rural	Plenty (Feb-Oct)	N/A	2.4	1.1	N/A	N/A	N/A	2.8	N/A	N/A	N/A	1.79
		Lean (Nov-Jan)	N/A	N/A	1.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.79
	Urban	Plenty (Feb-Oct)	8	2.4	0.98	N/A	N/A	3.5	2.8	2.5	N/A	N/A	2.66
		Lean (Nov-Jan)	N/A	N/A	0.98	N/A	0.55	3.5	N/A	2.5	N/A	N/A	2.66

			Oils and fats (price per 100g)			Herbs, spices and condiments (price per 100g)
			Margarine	Oil, corn	Oil, olive	Lemon
Nampula	Rural	Plenty (Feb-Oct)	N/A	8.52	N/A	6.5
		Lean (Nov-Jan)	N/A	8.52	N/A	6.5
	Urban	Plenty (Feb-Oct)	22.2	5.81	N/A	6.5
		Lean (Nov-Jan)	22.2	5.81	N/A	6.5
Niassa	Rural	Plenty (Feb-Oct)	22.2	7.7	N/A	6.5
		Lean (Nov-Jan)	22.2	7.7	N/A	6.5
	Urban	Plenty (Feb-Oct)	22.2	6.15	N/A	6.5
		Lean (Nov-Jan)	22.2	6.15	N/A	N/A
Sofala	Rural	Plenty (Feb-Oct)	N/A	7.2	N/A	4.2
		Lean (Nov-Jan)	N/A	7.2	N/A	N/A
	Urban	Plenty (Feb-Oct)	27.4	6.31	N/A	4.2
		Lean (Nov-Jan)	27.4	6.31	N/A	N/A
Tete	Rural	Plenty (Feb-Oct)	28.4	6.7	N/A	4.2
		Lean (Nov-Jan)	28.4	6.7	N/A	4.2
	Urban	Plenty (Feb-Oct)	29.4	5.93	N/A	4.2
		Lean (Nov-Jan)	29.4	5.93	N/A	4.2
Zambezia	Rural	Plenty (Feb-Oct)	26.4	7.2	N/A	4.2
		Lean (Nov-Jan)	26.4	7.2	N/A	N/A
	Urban	Plenty (Feb-Oct)	27.4	6.31	N/A	4.2
		Lean (Nov-Jan)	27.4	6.31	N/A	N/A

Appendix Table 3: Minimum food frequency constraint rules for servings of staple food per week for the SNUT diet (all household members and 12-23 mo old child) by province

				Maize	Cassava	Rice	Wheat flour	TOTAL
NORTH	Niassa Rural		HH	7	7			14
			Child	4	3			7
	Niassa Urban		HH	7	5	1	1	14
			Child	3	2	1	1	7
	Cabo Delgado Rural		HH	7	7			14
			Child	4	3			7
	Cabo Delgado Urban	Plenty Season (Aug-Oct)	HH	7	5	2		14
			child	4	2	1		7
		Lean Season (Nov - Jan)	HH	7		7		14
			Child	4		3		7
	Nampula Rural		HH	7	7			14
			Child	4	3			7
	Nampula Urban	Plenty Season (Aug-Oct)	HH	7	5	1	1	14
			Child	3	2	1	1	7
		Lean Season (Nov - Jan)	HH	7		5	2	14
			Child	4		2	1	7
CENTRAL	Zambézia Rural		HH	14				14
			Child	7				7
	Zambézia Urban		HH	7		5	2	14
			Child	4		2	1	7
	Tete Rural		HH	14				14
			Child	7				7
	Tete Urban		HH	7		5	2	14
			Child	4		2	1	7
	Manica Rural		HH	14				14
			Child	7				7
	Manica Urban		HH	7		5	2	14
			Child	4		2	1	7
	Sofala Rural		HH	14				14
			Child	7				7
	Sofala Urban		HH	7		5	2	14
			Child	4		2	1	7

				Maize	Cassava	Rice	Wheat flour	TOTAL
SOUTH	**Inhambane Rural**		**HH**	14				**14**
			Child	7				**7**
	Inhambane Urban		**HH**	7		5	2	**14**
			Child	4		2	1	**7**
	Gaza Rural		**HH**	14				**14**
			Child	7				**7**
	Gaza Urban		**HH**	7		5	2	**14**
			Child	4		2	1	**7**
	Maputo Province Rural		**HH**	14				**14**
			Child	7				**7**
	Maputo Província Urban		**HH**	7		5	2	**14**
			Child	4		2	1	**7**
	Maputo Cidade Urban		**HH**	7		5	2	**14**
			Child	4		2	1	**7**

Appendix Table 4: Foods selected by Cost of the Diet software for Staple Adjusted Nutritious Diet (CotD 2017)

	Cabo Delgado		Gaza		Inhambane		Manica		Maputo Province		Maputo City	Nampula		Niassa		Sofala		Tete		Zambezia	
	R	U	R	U	R	U	R	U	R	U	U	R	U	R	U	R	U	R	U	R	U
Maize, white, grain or flour	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Rice, white, raw	x	x		x	x	x		x		x	x		x	x	x		x	x	x	x	x
Sorghum, flour																					x
Tapioca, pearl, dry										x											
Wheat, flour, all purpose, 72% extract		x		x		x		x	x	x	x		x		x		x		x		x
Cassava, flour (Manioc, farine)		x																			
Cassava, tuber, dried (Manioc, racine, séchée)											x		x	x	x		x				
Cassava, tuber, raw (Manioc, racine, crue)	x	x	x						x			x	x	x	x	x				x	x
Sweet potato, raw																x					
Bean, moth, mature, raw														x				x	x		
Cowpea, uncooked	x	x	x		x	x	x					x	x	x	x	x		x			x
Peanut	x		x			x								x		x		x			
Pigeon pea, raw	x			x							x	x		x	x	x	x		x	x	x
Soybean, raw																	x				
Beef, liver, raw (Bœuf, foie, cru)				x				x		x	x			x	x				x		x
Chicken, liver, raw			x	x		x	x	x	x	x	x						x		x		
Crab, sea, raw	x																				
Fish, dried	x	x	x	x	x							x	x	x	x	x		x	x	x	
Fish, mackerel, atlantic, raw	x		x	x								x	x								
Fish, sardine, atlantic, canned in oil, drained														x							
Shrimp, dried					x	x	x	x	x	x	x	x	x			x	x			x	x
Egg, whole, raw	x	x	x	x								x		x	x			x	x		
Bean, fava, mature, raw	x	x										x	x	x							

	Cabo Delgado		Gaza		Inhambane		Manica		Maputo Province		Maputo City	Nampula		Niassa		Sofala		Tete		Zambezia	
Leaf, amaranth, raw	x	x		x	x	x	x	x	x	x		x	x	x			x	x	x	x	x
Leaf, bean, winged, raw	x		x		x		x				x	x			x	x	x	x	x		x
Leaf, bitter gourd, raw			x	x													x				
Leaf, cassava		x		x	x	x	x	x			x		x		x	x	x	x	x	x	x
Leaf, collards, raw	x	x	x						x	x		x		x	x						
Mushrooms, white, raw																		x			
Okra, raw			x																		
Coconut, meat	x	x	x	x	x	x	x	x	x	x	x	x	x		x		x		x	x	x
Mango												x									
Tomato, red, ripe, raw												x									
Oil, corn	x		x			x			x			x		x		x		x			

Appendix Table 5: Limiting nutrients from Cost of the Diet analysis

Child 12-23 months Harvest season		**Vitamin A**	**Vitamin C**	**Vitamin B1**	**Vitamin B2**	**Niacin**	**Pantothenic acid**	**Vitamin B6**	**Folic acid**	**Vitamin B12**	**Calcium**	**Iron**	**Magnesium**	**Zinc**
Niassa	rural	U					X				X	X		
	urban										X	X		
Cabo Delgado	rural									X	X	X		
	urban									X		X		
Nampula	rural						X			X	X	X		
	urban									X	X	X		
Zambezia	rural									X	X	X		X
	urban									X	X	X		
Tete	rural						X			X		X		
	urban									X	X	X		X
Manica	rural						X				X	X		
	urban									X	X	X		X
Sofala	rural						X			X	X	X		X
	urban							X			X	X		X
Inhambane	rural						X			X	X	X		X
	urban									X	X			X
Gaza	rural	U					X				X	X		
	urban										X	X		X
Maputo Province	rural										X	X		X
	urban										X	X		
Maputo City														
	urban	U							X		X	X		

X indicates limiting nutrient; U indicates upper limit

Child 12-23 months Lean season		Vitamin A	Vitamin C	Vitamin B1	Vitamin B2	Niacin	Pantothenic acid	Vitamin B6	Folic acid	Vitamin B12	Calcium	Iron	Magnesium	Zinc
Niassa	rural	U									X	X		
	urban	U					X		X	X		X		
Cabo Delgado	rural									X	X	X		
	urban									X		X		
Nampula	rural	X		X	X						X	X		X
	urban									X	X	X		X
Zambezia	rural									X	X	X		X
	urban									X	X	X		
Tete	rural						X			X		X		
	urban										X	X		X
Manica	rural						X				X	X		
	urban									X	X	X		X
Sofala	rural									X	X	X		X
	urban							X			X	X		X
Inhambane	rural						X			X	X	X		X
	urban						X			X	X			X
Gaza	rural	U					X				X			
	urban										X	X		X
Maputo Province	rural										X	X		X
	urban										X	X		
Maputo City														
	urban	U							X		X	X		

X indicates limiting nutrient; U indicates upper limit

Child 6-7 years Harvest season		Vitamin A	Vitamin C	Vitamin B1	Vitamin B2	Niacin	Pantothenic acid	Vitamin B6	Folic acid	Vitamin B12	Calcium	Iron	Magnesium	Zinc
Niassa	rural						X				X	X		
	urban						X			X	X			
Cabo Delgado	rural	X					X			X	X			
	urban	X					X			X	X	X		
Nampula	rural	X					X			X	X			
	urban						X			X	X			
Zambezia	rural						X			X	X			
	urban						X			X	X			
Tete	rural	x					X			X	X			
	urban						X			X	X			
Manica	rural	U					X				X			
	urban						X			X	X			
Sofala	rural						X			X	X			
	urban						X				X			
Inhambane	rural						X			X	X			
	urban									X	X			
Gaza	rural	U					X				X			
	urban						X			X	X			
Maputo Province	rural	U					X				X			
	urban						X			X	X			
Maputo City														
	urban						X			X	X			

X indicates limiting nutrient; U indicates upper limit

Child 6-7 years Lean season		Vitamin A	Vitamin C	Vitamin B1	Vitamin B2	Niacin	Pantothenic acid	Vitamin B6	Folic acid	Vitamin B12	Calcium	Iron	Magnesium	Zinc
Niassa	rural						X			X	X			
	urban						X			X	X			
Cabo Delgado	rural	X					X				X			
	urban						X			X	X			
Nampula	rural	X									X			
	urban						X			X	X			
Zambezia	rural						X			X	X			
	urban						X			X	X			
Tete	rural						X			X	X			
	urban						X			X	X			
Manica	rural	U					X				X			
	urban						X			X	X			
Sofala	rural						X			X	X			
	urban						X				X			
Inhambane	rural						X			X	X			
	urban						X			X	X			
Gaza	rural	U					X				X			
	urban						X			X	X			
Maputo Province	rural	U					X				X			
	urban						X			X	X			
Maputo City														
	urban						X			X	X			

X indicates limiting nutrient; U indicates upper limit

Adolescent girl 14-15 years Harvest season		Vitamin A	Vitamin C	Vitamin B1	Vitamin B2	Niacin	Pantothenic acid	Vitamin B6	Folic acid	Vitamin B12	Calcium	Iron	Magnesium	Zinc
Niassa	rural	U							X		X	X		
	urban	U									X	X		
Cabo Delgado	rural	U									X	X		
	urban	U										X		
Nampula	rural										X	X		
	urban										X	X		
Zambezia	rural										X	X		
	urban										X	X		
Tete	rural	U								X		X		
	urban	U									X	X		
Manica	rural	U									X	X		
	urban										X	X		
Sofala	rural										X	X		
	urban	U									X	X		
Inhambane	rural						X			X	X	X		
	urban	U									X	X		
Gaza	rural	U									X	X		
	urban	U									X	X		
Maputo Province	rural	U									X	X		
	urban	U									X	X		
Maputo City														
	urban	U							X		X	X		

X indicates limiting nutrient; U indicates upper limit

Adolescent girl 14-15 years Lean season		Vitamin A	Vitamin C	Vitamin B1	Vitamin B2	Niacin	Pantothenic acid	Vitamin B6	Folic acid	Vitamin B12	Calcium	Iron	Magnesium	Zinc
Niassa	rural	U									X	X		
	urban	U							X			X		
Cabo Delgado	rural	U							X			X		
	urban	U										X		
Nampula	rural	X									X	X		
	urban										X	X		
Zambezia	rural										X	X		
	urban										X	X		
Tete	rural	U								X		X		
	urban	U									X	X		
Manica	rural	U									X	X		
	urban										X	X		
Sofala	rural										X	X		
	urban	U							X		X	X		
Inhambane	rural						X			X	X	X		
	urban	U									X	X		
Gaza	rural	U								X	X	X		
	urban	U									X	X		
Maputo Province	rural	U									X	X		
	urban	U									X	X		
Maputo City														
	urban	U							X		X	X		

X indicates limiting nutrient; U indicates upper limit

Woman 30-59 years Harvest season		Vitamin A	Vitamin C	Vitamin B1	Vitamin B2	Niacin	Pantothenic acid	Vitamin B6	Folic acid	Vitamin B12	Calcium	Iron	Magnesium	Zinc
Niassa	rural	U					X				X	X		
	urban	U					X				X	X		
Cabo Delgado	rural						X			X		X		
	urban						X			X		X		
Nampula	rural	X			X		X			X	X			
	urban	X					X			X	X			
Zambezia	rural						X				X			
	urban				X		X		X	X	X	X		
Tete	rural						X			X		X		
	urban										X	X		
Manica	rural						X				X	X		
	urban										X	X		
Sofala	rural						X				X			
	urban	U							X		X	X		
Inhambane	rural						X				X			
	urban										X	X		
Gaza	rural	U					X				X	x		
	urban										X	X		
Maputo Province	rural	U									X	X		
	urban										X	X		
Maputo City														
	urban	U									X	X		

X indicates limiting nutrient; U indicates upper limit

Woman 30-59 years Lean season		Vitamin A	Vitamin C	Vitamin B1	Vitamin B2	Niacin	Pantothenic acid	Vitamin B6	Folic acid	Vitamin B12	Calcium	Iron	Magnesium	Zinc
Niassa	rural	U					X			X	X	X		
	urban						X		X	X		X		
Cabo Delgado	rural						X					X		
	urban									X	U	X		
Nampula	rural	X		X	X						X			
	urban				X		X			X	X	X		
Zambezia	rural						X				X			
	urban						X			X	X	X		
Tete	rural						X			X		X		
	urban										X	X		
Manica	rural						X				X	X		
	urban						X				X	X		
Sofala	rural						X			X	X			
	urban										X	X		
Inhambane	rural						X			x	X			
	urban										X	X		
Gaza	rural	U					X				X			
	urban										X	X		
Maputo Province	rural	U									X	X		
	urban										X	X		
Maputo City														
	urban	U									X	X		

X indicates limiting nutrient; U indicates upper limit

Appendix Table 6:Underlying assumptions made for dietary improvement models

Type of intervention	Intervention	Target Group	Details	Entry Point	Modality
Increased availability of Biofortified foods	Orange Flesh Sweet Potato Beans - Higher Iron Cassava - Vitamin A	Household	Increased production, availability and access	Private sector Agriculture	Markets Home production
Post Harvest Losses	Reduction of post-harvest losses -> Increased amount of money to spend on food		Increase of 20% in household food budget example	Agriculture	Home production
Fortified Staple foods	Mandatory - Oil, wheat flour, maize flour, salt, sugar fortification	Household	WHEAT FLOUR Iron, Folate, B12, Zinc (mandatory levels as per national legislation) MAIZE FLOUR Iron, Folate, B12, Zinc (mandatory levels as per national legislation) OIL Vitamin A (mandatory levels as per national legislation) SUGAR Vitamin A (mandatory levels as per national legislation) SALT (not possible to test in CotD) Iodine A (mandatory levels as per national legislation)	Private Sector	Market Price Discount Price In-Kind Vouchers

Type of intervention	Intervention	Target Group	Details	Entry Point	Modality
WFP Food for Assets	Reduced WFP ration	Household	Weekly ration: maize flour 9310g; kidney bean 1400g	Social protection	In-kind
	Reduced WFP ration with fortified flour	Household	Weekly ration: maize flour (fortified) 9310g; kidney bean 1400g	Social protection	In-kind
	Full WFP ration	Household	Weekly ration: maize flour 14000g; kidney bean 2100g; vegetable oil 875g	Social protection	In-kind
	Full WFP ration with fortified flour and oil	Household	Weekly ration: maize flour 10500g; kidney bean 5250g; vegetable oil 875g	Social protection	In-kind
	Cash based transfer implemented through food vouchers	Household	Weekly ration: maize flour 10500g; kidney bean 5250g; vegetable oil 875g; sugar 875g	Social protection	Cash cards to purchase commodities
Complementary foods (fortified and unfortified) for children 6-23 months	Super Cereal	6-23 mo children	30-60g per day	Private sector Health Social protection	Market price In-kind Vouchers
	Super Cereal +	6-23 mo children	30-60g per day		
	Nutributter	6-23 mo children	20g per day		
Specialised nutritious foods for Pregnant and Lactating women and adolescent girls	MQ-LNS	Adolescent girls and PLW	50g per day adolescent girls and 70g per day PLW	Private sector Health Social protection	Market price In-kind Vouchers
	Super Cereal	Adolescent girls and PLW	60-120g per day		
	Super Cereal +	Adolescent girls and PLW	60-120g per day		

Type of intervention	Intervention	Target Group	Details	Entry Point	Modality
Supplementation with multiple micronutrients (MMT) or iron/folic acid	Iron + Folic acid	Adolescent girls and PLW	As per government policy/ international guidelines	Health Social protection	In-kind
	MNP (Micro Nutrient Powder)	6-23 mo children			
	MMT (Multiple Micronutrient Tablet)	Adolescent girls and PLW			
School Feeding Programmes	School Feeding	School aged children	Basic basket: (Fortified maize meal, beans; Fortified vegetable oil; Iodized salt) compared to Improved basket (with locally produced vegetables) compared to improved basket + animal protein (experimental)	Education	In-kind
Cash transfers for vulnerable households	Social Safety Nets Programme	Household	610 MZN per household per month	Social Protection	In-kind
	30% of poor household's expenditure	Household	1785 MZN per household per month		

Appendix Table 7: Nutrient composition per 100 g of biofortified bean, orange flesh sweet potato and biofortified cassava

Nutrient	Amount per 100g		
	Biofortified Bean	**Orange Flesh Sweet Potato**	**Biofortified Cassava**
Source	Harvest Plus	USDA	CIAT
Iron Absorption factor	0.05	0.05	0.05
Calcium absorption factor	1	1	1
Energy (Kcal)	343	86	131
Protein (g)	22.7	1.57	1.1
Fat Total (g)	1.6	0.05	0.3
Vit A Equiv Retinol (mcg)	0	709	**1000**
Vit C (mg)	1	2.4	30
B1 - Thiamin (mg)	0.47	0.08	0.13
B2 - Riboflavin (mg)	0.15	0.06	0.02
Niacin (mg)	2.09	0.56	0.85
Vit. B6 (mg)	0.53	0.21	0.29
Folate Equivalent (mcg)	463	11	15
Folic Acid (mcg)	0	0	
Vit. B12 (mcg)	0	0	0
Pantothenic Acid	0.22	0.8	0.29
Calcium (mg)	134	30	19
Iron (mg)	8.6	0.61	0.8
Magnesium (mg)	45	25	10
Zinc (mg)	3	0.3	0.3
Carbohydrates (g)	62.36	20.12	31.9
Saturated fat (g)	0.29	0.02	0.1
Mono-unsaturated fat (g)	0.12	0	0.1
Poly-unsaturated fat (g)	0.61	0.01	0.1
Dietary Fiber Total (g)	15.5	3	1.5
Phytate (mg)	617	0	54
Copper	0.24	0.15	0.15
Phosphorous (mg)	142	47	70
Potassium (mg)	403	337	243
Manganese*	0.48	0.26	0.4
Sodium (mg)	2	55	2

Appendix Table 8: Nutrient composition per 100 g of Nutributter, MQ-LNS, MNP, IFA, MMT and Super Cereal

Nutrient	Nutributter	MQ-LNS	MNP Child 12-23 months	MNP Child 6-7 years	IFA	MMT	Super Cereal
Portion size (g)	20g	75g	3g per week	0.4g/school days	1g per day	1g per day	60g child; 120g adolescent girl and lactating woman
Energy (kcal)	530	510		0		0	410
Protein (g)	11.8	11		0		0	16
Fats (g)	37.8	26		0		0	
Saturated Fat (g)	30.9	0		0		0	
Monounsaturated Fat (g)	0	0		0		0	
Polyunsaturated Fat (g)	0	0		0		0	
Carbohydrate (g)	0	0		0		0	
Fiber (g)	0	0		0		0	9
Phytate (mg)	0	0		0		0	
RAE (ug retinol)	2000	1050	40000	125000		80000	1039
Vit C (mg)	150	90	500	7000		7000	90
B1 (mg)	1.5	1.5	50	220		140	0.2
B2 (mg)	2	2.6	50	220		140	1.4
Niacin (mg)	20	16	600	3000		1800	8
B6 (mg)	1.4	1.8	50	250		190	1
Folate (mcg)	600	300	15000	765000	40000	66667	110
B12 (mcg)	2.5	2.7	90	450		260	2
Pantothenic Acid (mg)	8	4.9		0		0	1.6
Calcium (mg)	450	534		0		0	362
Copper (mg)	0.9	1.4		0		200	
Iron (mg)	40	10	1000	3100	30000	30000	4
Magnesium (mg)	70	150		0		0	
Manganese (mcg)	0	1.2		0		0	
Phosphorous (mg)	0	450		0		0	280
Potassium (mg)	0	900		0		0	140
Sodium (mg)	0	270		0		0	
Zinc (mg)	18	11	410	1500		0	5

Appendix Table 9: Full modelling results for all provinces (All values are daily costs in 2015 MZN)

Child 12-23 months		Nutritious diet	Nutributter	MNP	Super Cereal	No Breastfeeding	Beans (20g)	OFSP (60g)	Green leaf (50g)	Tomato (30g)	Fish (10g)	Egg (40g)	Chicken (10g)	Milk powder (10g)	Banana (60g)	Mango (60g)	Beans + Grean leaf	Beans + grean leaf + egg	Beans + grean leaf + egg +mango	Beans+ green leaf + eggs + OFSP
Niassa	rural	6.7	3.0	5.6	6.1	8.4	6.0	6.6	5.4	6.6	6.5	4.9	6.3	5.6	6.5	6.5	4.8	3.1	3.1	3.0
	urban	6.5	3.5	5.6	6.4	8.0	5.9	6.5	5.5	6.5	6.3	4.7	6.2	6.1	6.5	6.5	5.5	3.1	3.0	3.0
Cabo Delgado	rural	7.4	3.6	5.6	7.3	8.3	6.6	7.4	6.2	7.4	7.2	5.1	7.0	7.4	7.4	7.4	5.4	3.2	3.1	3.0
	urban	7.6	3.8	5.6	7.4	7.7	6.7	7.6	6.6	7.6	7.4	5.2	7.2	7.5	7.6	7.6	5.7	3.3	3.2	3.3
Nampula	rural	5.8	2.7	4.4	2.8	7.1	5.6	4.6	4.1	5.7	5.7	4.3	5.7	4.6	5.8	5.5	3.8	2.4	2.4	2.3
	urban	4.8	2.7	4.3	3.3	6.0	4.4	4.7	4.0	4.8	4.7	3.8	4.7	4.1	4.8	4.8	2.5	2.5	2.5	2.4
Zambezia	rural	4.0	2.6	3.6	2.5	5.3	3.6	3.8	3.2	3.9	3.8	3.2	3.9	3.2	3.9	3.9	2.9	2.2	2.1	2.0
	urban	5.3	3.4	4.8	3.0	6.0	4.8	5.2	4.4	5.3	5.2	4.2	5.2	4.7	5.3	5.3	3.9	2.8	2.8	2.7
Tete	rural	4.7	2.2	3.8	4.2	6.5	4.3	4.7	4.2	4.7	4.4	3.0	4.4	4.2	4.7	4.7	3.8	1.9	1.9	1.8
	urban	4.9	3.0	4.0	3.7	6.4	4.3	4.8	3.9	4.8	4.8	4.0	4.7	4.2	4.9	4.9	3.3	2.6	2.5	2.4
Manica	rural	3.7	2.4	3.6	2.9	4.8	3.3	3.7	3.0	3.7	3.6	2.9	3.6	3.7	3.6	3.6	2.7	2.0	1.9	1.8
	urban	4.9	3.2	4.1	3.2	5.6	4.4	4.8	3.8	4.9	4.9	4.1	4.8	4.3	4.9	4.9	3.3	2.5	2.4	2.3
Sofala	rural	4.2	2.5	3.8	2.4	6.0	3.9	4.0	3.4	4.1	4.0	3.2	4.0	3.4	4.1	4.1	3.2	2.2	2.1	2.0
	urban	3.7	2.2	3.2	3.4	4.6	3.3	3.7	3.2	3.7	3.6	2.8	3.6	3.6	3.7	3.7	2.7	1.9	1.9	1.9
Inhambane	rural	4.1	2.4	3.6	2.6	5.7	3.8	3.9	3.4	4.0	3.8	3.0	3.9	3.4	4.0	4.0	3.2	2.0	1.9	1.8
	urban	4.9	3.5	4.5	3.4	4.9	4.4	4.9	4.2	4.9	4.9	4.2	4.9	4.3	4.9	4.9	4.0	3.4	3.2	3.2
Gaza	rural	3.9	2.9	3.9	3.5	5.4	3.7	3.9	3.1	3.9	3.8	3.2	3.8	3.2	3.7	3.8	2.9	2.1	2.0	2.0
	urban	4.1	2.5	3.5	3.7	4.7	3.6	4.1	3.5	4.1	4.1	2.8	4.1	3.7	4.1	4.1	2.9	2.1	2.0	2.0
Maputo Province	rural	6.5	3.9	6.3	4.4	7.6	5.8	6.5	5.1	6.5	6.5	5.4	6.3	5.5	6.5	6.5	4.2	3.2	3.1	3.0
	urban	6.9	4.8	6.7	4.9	8.4	6.2	6.8	5.7	6.9	6.8	6.0	6.8	5.9	6.7	6.7	4.7	3.8	3.7	3.5
Maputo City	urban	6.1	4.3	5.9	4.9	7.0	5.5	6.1	5.0	6.0	6.0	5.1	5.9	5.3	6.1	6.1	4.3	3.5	3.5	3.4
National Average	rural	4.9	2.7	4.2	3.5	6.4	4.5	4.6	4.0	4.9	4.8	3.7	4.7	4.2	4.9	4.8	3.6	2.3	2.2	2.2
National Average	urban	4.6	2.8	4.1	3.5	5.4	4.2	4.5	3.8	4.6	4.5	3.6	4.5	4.1	4.6	4.6	3.2	2.4	2.3	2.3

Child 6-7 years		Nutritious diet	Unfortified ration	Fortified ration	Fortified ration + amaranth leaf & tomatoes	Fortified ration + eggs	Fortified ration + SC	Fortified ration + milk	Fortified ration + eggs + milk	Snack (yogurt)	Fortified ration + yogurt	Fortified ration + dried fish	Fortified ration + frozen fish	Basic package unfortified With Micronutrient Powder	Basic package fortified With Micronutrient Powder	Improved package fortified with MNP	Animal protein package fortified with MNP
Niassa	rural	13.59	12.09	11.9	11.83	9.63	9.12	9.02	6.57	12.58	10.88	11.82	11.62	11.77	11.77	11.7	9.54
	urban	13.18	12	11.96	11.74	9.84	8.98	9.42	7.22	12.06	11.96	11.86	11.7	11.77	11.77	11.54	9.71
Cabo Delgado	rural	13.59	12.24	12.2	12.02	10.26	9.02	9.38	7.65	13.29	11.73	11.86	11.69	11.41	11.4	11.21	10.12
	urban	13.44	12.25	12.14	12	10.48	9.08	9.54	8.4	13.25	11.94	11.75	11.66	11.49	11.49	11.25	10.24
Nampula	rural	15.64	13.96	13.69	13.02	11.74	6.76	10.64	8.73	13.65	11.92	13.25	13.33	8.88	8.75	8.28	7.52
	urban	10.8	9.8	9.78	9.62	8.33	7.03	5.69	4.59	10.01	8.96	9.22	9.26	8.49	8.49	8.3	7.43
Zambezia	rural	9.17	8.1	8.1	8.1	7.02	5.97	6.23	5.43	8.34	6.77	7.77	7.56	8.1	7.76	8.1	6.54
	urban	10.66	9.39	9.39	9.19	8.61	7.31	7.75	3.44	9.87	7.57	9.28	9.21	9.12	9.12	8.92	8.41
Tete	rural	12.63	11.09	11.03	11.09	8.4	7.83	8.18	5.75	12.62	11.02	10.39	10.22	9.65	9.65	9.65	7.57
	urban	9.71	8.87	8.37	8.37	8.12	6.94	6.9	6.73	7.47	6.14	8.21	8.32	8.11	8.11	8.11	7.9
Manica	rural	8.48	7.45	7.48	7.36	6.24	6.04	5.65	4.86	6.3	5.25	7.47	7.37	7.45	7.48	7.42	6.37
	urban	9.95	8.67	8.66	8.64	8.37	7.12	7.08	6.91	7.7	6.45	8.52	8.61	8.55	8.55	8.48	8.08
Sofala	rural	10.56	9.13	9.12	9.11	7.87	7.12	7.02	5.75	9.5	8.05	9.08	8.9	9.09	9.09	9.09	7.4
	urban	8.41	7.21	7.21	7.11	6.07	5.67	5.53	5.25	7.15	5.95	7.22	7.1	7.21	7.21	7.11	5.97
Inhambane	rural	10.19	9.18	9.16	9.15	7.41	6.69	6.89	5.11	9.71	8.63	8.92	8.72	8.71	8.71	8.73	6.69
	urban	8.97	7.52	7.51	7.64	7.33	6.39	6.32	6.13	7.53	6.1	7.31	7.42	7.35	7.35	7.51	6.96
Gaza	rural	9.86	8.49	8.53	8.38	7.36	7	6.36	5.28	6.88	5.77	8.1	8.39	8.49	8.58	8.35	7.36
	urban	8.86	7.52	7.52	7.61	7.24	6.33	6.54	4.5	7.39	6.08	7.37	7.44	7.4	7.4	7.51	7.03
Maputo Province	rural	12.31	10.35	10.37	10.43	9.58	8.93	8.24	7.56	9.28	7.31	10.32	10.38	10.35	10.37	10.43	9.53
	urban	14.31	12.31	12.13	11.68	12.64	9.94	9.9	9.05	10.23	8.24	10.04	12.06	12.28	12.28	11.59	11.68
Maputo City	rural																
	urban	13.54	10.34	10.33	10.37	10.03	8.77	8.3	8.14	10.41	10.33	8.45	10.26	10.3	10.3	10.35	9.84
National	rural	11.75	10.38	10.31	10.15	8.65	7.10	7.88	6.36	10.53	9.01	9.99	9.90	9.11	9.02	8.97	7.54
	urban	11.64	10.03	9.97	9.83	9.25	7.88	7.64	6.42	9.77	8.56	9.18	9.76	9.64	9.64	9.44	8.80

Adolescent girl 14-15 years		Nutritious diet	MMT	Iron & folic acid	Super cereal	Beans (50g)	OFSP (150g)	Green leaf (150g)	Tomato (80g)	Fish (40g)	Egg (40g)	Chicken (40g)	Milk powder (20g)	Banana (120g)	Mango (120g)	Beans + green leaf	Beans + green leaf + egg	Beans + green leaf + egg +mango	Beans+ green leaf + eggs + OFSP
Niassa	rural	50	24	24	50	47	50	47	50	49	46	48	50	50	50	44	40	40	40
	urban	47	24	24	47	45	47	45	47	47	44	45	47	47	47	45	38	38	38
Cabo Delgado	rural	58	24	25	58	56	58	52	58	57	52	55	58	58	58	50	46	46	46
	urban	55	24	24	55	53	55	51	55	54	51	53	55	55	55	49	46	46	46
Nampula	rural	28	19	27	19	27	23	22	27	28	26	27	25	28	27	21	20	19	18
	urban	23	18	20	21	22	23	21	23	23	22	23	22	23	23	19	19	19	19
Zambezia	rural	18	17	17	17	17	18	16	18	18	17	17	17	18	18	15	14	14	14
	urban	27	20	20	24	26	27	25	27	27	26	27	26	27	27	23	22	22	22
Tete	rural	41	20	23	41	41	41	39	41	40	37	39	41	41	41	38	34	34	34
	urban	43	17	18	22	43	43	40	43	43	39	41	43	43	43	40	36	36	36
Manica	rural	20	16	16	19	18	20	18	20	19	19	19	20	20	20	16	15	15	15
	urban	22	21	18	21	21	22	20	22	22	21	22	21	22	22	19	18	18	18
Sofala	rural	20	19	19	18	19	20	18	20	20	19	19	19	20	20	17	16	16	16
	urban	23	16	16	23	23	23	21	23	23	22	23	23	23	23	21	20	20	20
Inhambane	rural	19	18	19	19	19	19	18	19	19	18	19	18	19	19	17	16	16	16
	urban	20	16	16	19	19	20	19	20	20	19	20	20	20	20	18	17	17	17
Gaza	rural	33	19	19	33	33	33	29	33	33	29	32	33	33	33	28	24	24	24
	urban	42	18	16	42	40	42	40	42	41	38	42	42	42	42	37	33	33	33
Maputo Province	rural	32	23	23	30	30	32	28	32	32	31	31	30	32	32	26	25	25	25
	urban	33	27	27	31	31	33	30	33	33	32	36	32	33	33	28	26	26	26
Maputo City	rural																		
	urban	32	25	26	31	31	32	29	35	32	31	32	31	32	32	27	26	26	26
National Average	rural	30	19	21	28	29	29	27	30	29	28	29	29	30	30	25	23	23	23
	urban	31	21	22	29	30	31	28	32	31	30	31	30	31	31	27	25	25	25

Lactating woman		Nutritious diet	MMT	Iron and folic acid	Super cereal	MQ-LNS	Beans (50g)	OFSP (150g)	Green leaf (150g)	Tomato (80g)	Fish (40g)	Egg (40g)	Chicken (40g)	Milk powder (20g)	Banana (120g)	Mango (120g)	Beans + Green leaf	Beans + green leaf + egg	Beans + green leaf + egg +mango	Beans+ green leaf + eggs + OFSP
Niassa	rural	35	28	29	32	26	34	35	33	35	35	32	34	33	35	35	32	28	27	26
	urban	34	28	29	31	26	33	33	32	34	33	31	33	32	34	34	32	27	27	24
Cabo Delgado	rural	46	29	32	43	36	44	44	43	46	45	41	44	46	46	46	41	36	36	34
	urban	43	27	29	43	37	41	43	39	43	42	39	41	43	43	43	38	34	34	34
Nampula	rural	29	20	29	14	14	28	20	23	28	28	26	28	26	28	27	23	21	19	14
	urban	22	20	22	17	16	21	20	20	21	21	20	21	20	21	21	18	18	17	16
Zambezia	rural	19	19	19	12	12	19	16	17	19	18	17	18	18	18	18	17	16	15	13
	urban	25	22	23	20	20	24	24	22	25	24	24	24	23	24	24	22	19	19	19
Tete	rural	30	24	28	26	21	30	28	29	30	29	26	29	29	30	30	29	25	25	23
	urban	19	17	17	17	16	18	19	17	19	19	18	19	18	19	19	16	15	15	15
Manica	rural	16	16	16	13	12	16	16	15	16	16	15	16	16	16	16	14	13	12	12
	urban	20	16	19	16	16	19	20	18	20	20	19	20	19	20	20	17	16	16	16
Sofala	rural	21	21	21	13	13	21	18	19	21	20	19	20	18	20	20	19	17	17	14
	urban	19	17	17	17	17	18	19	18	19	19	18	19	19	19	19	17	16	16	16
Inhambane	rural	22	22	22	14	13	22	19	21	22	21	20	21	20	21	21	21	18	18	15
	urban	19	17	17	16	16	18	18	17	19	18	18	19	18	19	19	16	16	16	15
Gaza	rural	17	17	17	15	13	17	17	15	17	17	16	17	16	17	17	14	13	13	12
	urban	18	17	17	25	16	18	18	17	18	18	17	18	18	18	18	16	15	15	15
Maputo Province	rural	29	23	23	20	20	24	26	22	26	25	24	25	24	25	25	20	19	19	19
	urban	28	26	26	20	22	26	27	24	28	28	27	27	26	28	28	22	21	21	21
Maputo City	rural																			
	urban	25	23	23	22	21	24	25	22	25	25	24	25	24	25	25	21	20	20	20
National Average	rural	26	21	24	19	17	25	23	23	25	25	23	25	24	25	25	23	20	20	17
	urban	25	22	23	21	20	24	25	23	25	25	24	24	24	25	25	21	20	20	19

Household		Nutritious diet	Homegardening	Homegardening biofortified	Fortified (market)	FFA full	FFA reduced	FFA vouchers	FFA full fortified	FFA reduced fortified	Package 1	Package 2	Package 3	Package 4
Niassa	rural	127.1	84.01	80.27	92.03	104.3	113.98	98.3	72.98	82.99	92.44	96.72	62.89	69.1
	urban	122.53	88.39	82.06	91.62	106.72	110.93	98.94	78.8	84.13	91.56	95.6	83.79	76.79
Cabo Delgado	rural	146	104.33	90.63	96.27	122.7	131.8	116.47	78.98	87.56	93.67	109.26	74.89	77.76
	urban	139.94	114.44	104.37	93.57	121.47	126.03	115.89	79.16	85.74	91.2	108.99	78.54	76.84
Nampula	rural	100.69	85.55	55.95	79.53	84.07	91.41	82.9	79.74	90.29	81.97	74.68	38.59	45.62
	urban	78.43	75	58.54	69.61	66.56	69.92	64.93	63.65	68.04	70.75	66.21	59.23	57.44
Zambezia	rural	65.08	58.63	54.13	63.83	48.27	54.02	47.13	47.53	53.02	63.57	55.55	44.66	47.21
	urban	85.55	77.1	72.93	74.41	72.71	75.89	70.29	62.9	65.62	75.29	70.89	62.56	63.78
Tete	rural	108.02	102.41	95.56	83.31	79.69	88.94	79.97	64.54	74.15	79.47	82.28	80.19	78.36
	urban	93.73	86.06	84.02	64.71	66.24	71.24	62.81	49.75	55.46	64.97	64.48	56.98	57.17
Manica	rural	61.65	52.39	50.56	57.1	43.9	51.04	43.05	40.06	46.98	57.72	54.03	41.87	45.75
	urban	74.41	65.26	63.09	67.6	58.07	63.46	59.37	51.73	56.96	68.32	67.42	59.4	59.73
Sofala	rural	72.43	64.76	59.72	71.43	50.24	61.1	49.43	49.68	60.57	71.05	62.23	50.05	53.68
	urban	68.39	63.6	62.04	64.09	55.43	57.45	53.06	47.52	49.78	58.41	58.55	54.55	55.67
Inhambane	rural	72.51	63.94	57.61	70.43	57.34	62.59	56.2	56.51	61.73	70.33	61.34	47.63	51.88
	urban	68.5	59.73	58.28	60.72	49.33	56.21	48.19	42.84	49.85	61.87	59.84	54.47	53.2
Gaza	rural	79.12	72.19	71.49	64.22	56.26	62.65	53.11	49.79	53.2	65.21	62.33	54.64	62.87
	urban	88.74	79.98	88.74	59.25	71.42	72.69	63.16	42.01	48.79	62.44	70.73	52.79	52.08
Maputo Province	rural	100.51	80.91	78.03	83.84	63.76	76.77	62.48	51.11	64.35	85.15	80.17	64.02	72.63
	urban	107.0	90.01	85.89	98.46	80.65	87.13	78.31	72.35	79.17	98.86	90.4	84.35	84.91
Maputo City	rural	0												
	urban	100.09	92.32	89.19	88.6	72.27	76.53	69.3	64.22	68.97	90.78	88.72	75.96	76.86
National	rural	90.6	76.5	66.6	74.8	70.1	77.9	68.3	60.4	68.6	74.7	71.5	53.2	57.2
	urban	93.1	82.0	76.1	79.2	74.4	78.6	71.6	62.9	67.8	79.4	77.8	68.1	67.6

Household cost by member		child (12-23 months)	School-aged child (6-7 years)	Adolescent girl	Man, 50kg, moderately active (30-59 years)	Women, 45kg, moderately active (30-59 years) - Lactating	Daily Cost
Niassa	Rural	6.65	13.59	50.24	21.2	35.42	127.1
	Urban	6.5	13.18	47.49	21.03	34.33	122.53
Cabo Delgado	Rural	7.38	13.59	57.6	21.41	46.02	146
	Urban	7.59	13.44	54.8	21.25	42.86	139.94
Nampula	Rural	5.84	15.64	27.7	23.01	28.5	100.69
	Urban	4.81	10.8	23.27	17.9	21.65	78.43
Zambezia	Rural	3.96	9.17	17.8	15.32	18.83	65.08
	Urban	5.3	10.66	27.23	17.67	24.69	85.55
Tete	Rural	4.74	12.63	41.46	19.02	30.17	108.02
	Urban	4.86	9.71	43.18	16.73	19.25	93.73
Manica	Rural	3.69	8.48	19.58	13.52	16.38	61.65
	Urban	4.94	9.95	22.25	17.11	20.16	74.41
Sofala	Rural	4.16	10.56	19.89	17.09	20.73	72.43
	Urban	3.71	8.41	23.47	13.31	19.49	68.39
Inhambane	Rural	4.05	10.19	19.38	16.8	22.09	72.51
	Urban	4.92	8.97	20.26	15.7	18.65	68.5
Gaza	Rural	3.92	9.86	33.19	14.69	17.46	79.12
	Urban	4.14	8.86	42.11	15.18	18.45	88.74
Maputo Province	Rural	6.54	12.31	32.21	20.6	28.85	100.51
	Urban	6.91	14.31	33.34	24.57	27.85	106.98
Maputo City	Rural						
	Urban	6.05	13.54	32.14	22.91	25.45	100.09
National	Rural	4.94	11.75	29.87	18.34	25.73	90.62
	Urban	5.56	11.64	31.28	19.43	25.15	93.06

Appendix Table 10: Percentage of households unable to afford a nutritious diet with different packages and cash transfer amounts (%) (CotD Analysis 2017)

		Nutritious diet			Package 1			Package 2			Package 3			Package 4		
Household budget increase from cash transfer ->		0	430	1250	0	430	1250	0	430	1250	0	430	1250	0	430	1250
Niassa	rural	64	55	38	42	32	16	45	35	18	22	15	5	26	18	7
	urban	75	71	58	64	55	35	66	57	38	60	49	30	54	45	24
Cabo Delgado	rural	70	65	54	46	36	19	57	47	29	33	24	9	35	26	10
	urban	77	73	61	57	46	28	66	59	41	47	39	20	46	38	19
Nampula	rural	79	71	46	68	55	25	62	47	17	22	8	0	30	14	0
	urban	61	48	23	55	41	15	51	37	12	44	31	7	42	29	6
Zambezia	rural	55	40	13	53	38	12	45	29	8	32	18	0	36	21	0
	urban	64	55	30	58	47	22	55	42	19	48	34	12	49	35	12
Tete	rural	56	46	24	34	24	11	36	25	12	35	24	11	34	23	11
	urban	54	44	26	35	25	8	35	25	8	29	19	5	29	19	5
Manica	rural	18	12	3	16	11	2	15	9	2	10	4	0	12	6	0
	urban	25	17	6	22	15	4	21	15	4	17	11	2	17	11	2
Sofala	rural	51	36	12	48	35	11	40	25	6	27	15	1	32	19	2
	urban	32	21	3	24	13	1	24	14	1	21	11	0	22	11	0
Inhambane	rural	47	36	13	45	34	11	39	27	6	27	15	0	31	19	4
	urban	30	20	6	26	15	4	25	14	4	20	11	3	19	11	3
Gaza	rural	65	55	27	55	41	15	53	38	12	45	30	7	53	38	12
	urban	58	49	31	42	13	10	47	38	17	35	23	4	34	23	4
Maputo Province	rural	46	39	22	38	29	13	35	25	12	25	17	6	30	21	8
	urban	29.0	23	13	25	20	10	22	16	8	20	14	6	20	14	6
Maputo City	rural															
	urban	33	26	14	28	22	11	27	21	10	21	15	7	22	16	7
National	rural	57.8	47.5	25.8	47.6	35.9	14.4	44.8	31.9	12.1	27.8	16.1	3.1	31.9	19.5	4.0
	urban	47.6	39.1	22.3	40.3	30.3	13.8	39.3	29.9	13.6	33.0	23.5	8.5	32.5	23.1	7.8

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Appendix C: Fill the Nutrient Gap Mozambique preliminary findings workshop report (October 2nd, 2017)

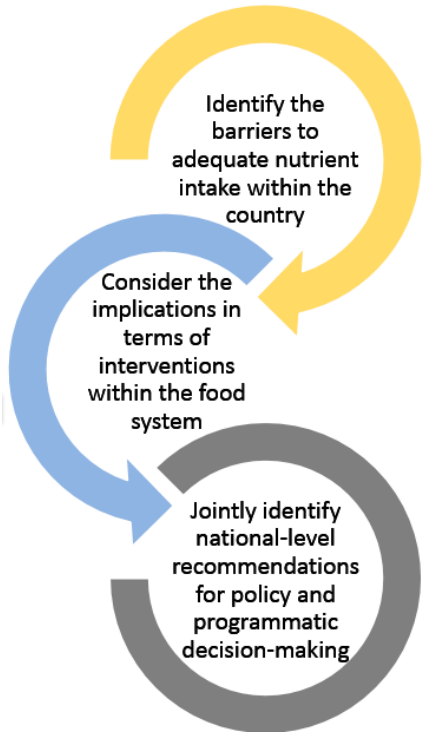
Fill the Nutrient Gap Mozambique
Workshop to present and discuss preliminary findings from the
Mozambique Fill the Nutrient Gap Analysis
Maputo, October 2nd 2017

1) Introduction to the Fill the Nutrient Gap tool

The Fill the Nutrient Gap (FNG) tool can be used to inform nutrition situation analysis and decision making (see figure 1). It was developed by WFP with technical input from key research institutes (University of California Davis, IFPRI, Epicentre, Harvard University and Mahidol University) and UNICEF.

The FNG leverages context-specific secondary data sources on factors that directly and indirectly impact whether people can access and consume nutritious foods and whether they are meeting recommended nutrient intakes. Using the Cost of the Diet (CotD) tool, the FNG estimates how much a nutritious diet would cost in different parts of the country for different household members and estimates the percentage of households that can and cannot afford the nutritious diet. Moving from these estimates, the tool is used to test the impact that current or potential multi-sectorial interventions (identified via secondary data analysis and consultations) could have on improving access to nutritious diets, alone or in combination.

Consequently, the aim of the FNG is to present data on the current situation that national stakeholders can then use to formulate recommendations for policies and programmes in agriculture, food systems, health, social protection, education and other sectors that can contribute to improving nutrition.



Appendix Figure 4: FNG Rationale

The FNG can:

- Identify barriers to adequate nutrient intake and nutrient gaps for vulnerable groups.
- Identify possible interventions across the agriculture, food, health, social protection, education and private sectors that could respond to these nutrient gaps.
- Estimate the cost of a nutritious diet for households across the country.
- Estimate the percentage of households in each area that would be able to afford this nutritious diet.
- Model the possible impact of different interventions, in terms of affecting the cost and affordability of nutritious diets, for key target groups and households.
- Mobilise stakeholders across sectors to address barriers to nutrient access.
- Facilitate collaborative development of joint recommendations for nutrition policy and programmes (to be taken forward by national actors).
- Identify data gaps in existing nutrition data.

The FNG does not:

- Estimate the cost of implementing the modelled interventions.
- Provide details on direct implementation of interventions.
- Address the role of health and sanitation in nutrition.

- Conduct primary data collection (other than market price data for Cost of the Diet analysis, where necessary).

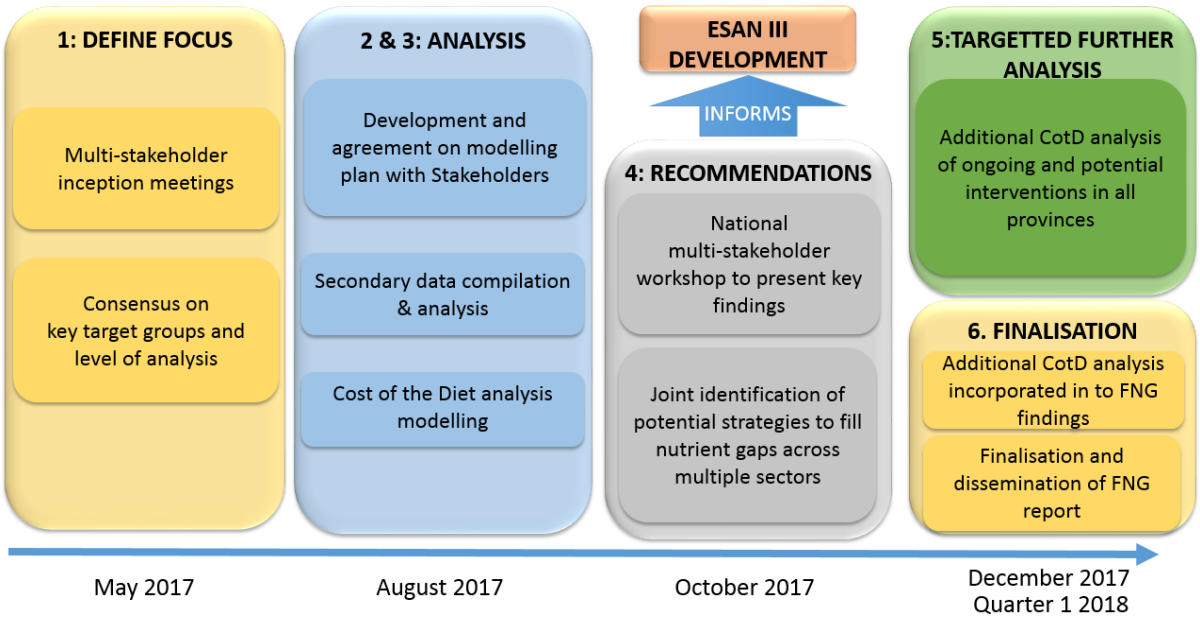
2) FNG Process in Mozambique

The FNG process followed in Mozambique is outlined in figure 2 below. The process started in May 2017 with multi-stakeholder inception meetings, to introduce the analysis and gather relevant data from stakeholders. In August 2017, the analysis plan was developed again as a result of multi- and bilateral meetings with stakeholders. The analysis plan identified key nutrition-specific and nutrition-sensitive interventions for modelling, based on ongoing and potential future interventions. Food price and availability data, for the CotD modelling, was provided by SETSAN, the National Institute of Statistics and, the Ministry of Finance.

In October 2017 preliminary findings from the secondary data review and the CotD analysis for all provinces, as well as the intervention modelling from four representative provinces, were shared during a national multi-stakeholder workshop. At this workshop, representatives from multiple sectors identified and shared potential strategies to fill the identified nutrient gaps. Participants were also asked to consider what further intervention modelling would be useful to inform planning processes and, what food price data should be used for such modelling.

In November 2017, the FNG team will further consult with stakeholders to review the list of interventions to be modelled for each province. Following this, the modelling of ongoing and potential interventions, will be completed in all provinces.

In the first quarter of 2018, the final modelling results for all provinces will be shared in detail during a two-day workshop to be held with technical stakeholders. The participating stakeholders will then work to prioritise actions and formulate context- and sector-specific recommendations for responding to identified nutrient gaps and improving nutrient access in Mozambique.



Appendix Figure 5: FNG Process in Mozambique

3) Workshop Overview

3.1 Objectives

A multi-stakeholder workshop, convened by SETSAN, was held in Maputo on October 2nd, 2017. The workshop objectives were:

- To share and discuss the results of the preliminary FNG analysis and intervention modelling undertaken in four provinces (Nampula, Zambezia, Tete and Gaza) – although the final results will include all the Mozambican provinces.
- For all stakeholders, representing different sectors from the food, health and/or social protection system in Mozambique, to discuss the FNG findings in relation to their context, and prioritise a set of nutrition-specific and nutrition-sensitive actions, that can be adopted by each specific sector and be included in the national nutrition strategy and action plan.
- For all stakeholders to:
    - Consider where further CotD modelling, based on current food prices and availability in specific (to be selected) areas, would assist in decision making on the prioritisation and planning of nutrition interventions;
    - Define the scope of primary food price and availability data collection so as to represent priority areas or contexts, in terms of greatest need and/or not represented in the province-level analysis.

3.2 Participants

45 participants representing government, UN, donor and non-government institutions attended the workshop. A list of institutions represented can be found in appendix 1.

3.3 Meeting discussion

The meeting included three areas of discussion:

1. Introduction to and discussion of the FNG, the FNG process in Mozambique and, presentation of FNG preliminary findings for Mozambique for at least four provinces.
2. Group discussion to prioritise national multi-sectorial nutrition actions (described in detail below).
3. Group discussion to inform further intervention modelling and to decide if additional primary data collection (described in detail below) was needed, and if so, which strategy would be preferred.

The circulated agenda is provided in appendix 2.



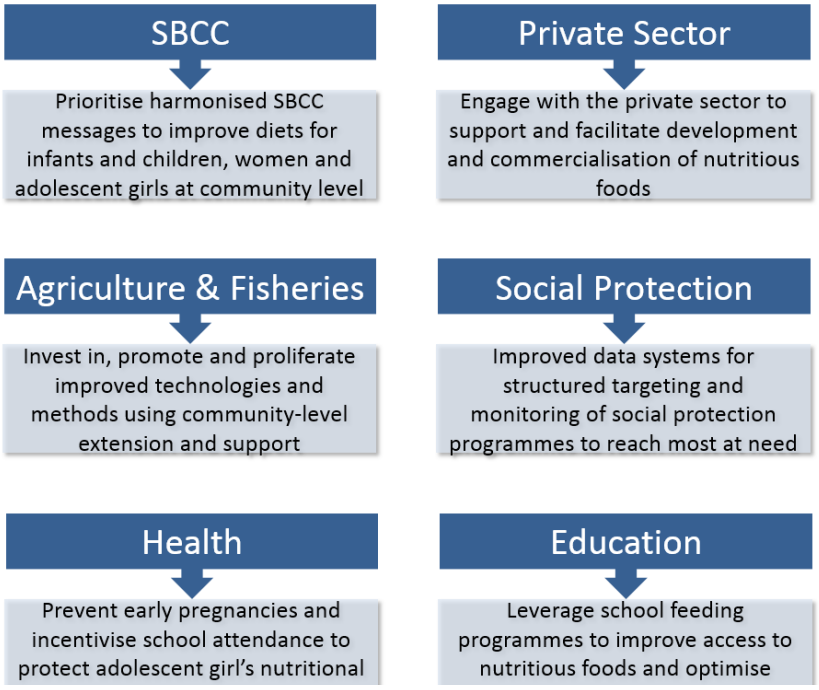
Presentation of the FNG Key Findings and Process in Mozambique

4) Workshop Session 1: Prioritisation of activities by sector based on FNG preliminary findings

For the first discussion, following the results sharing, sector-specific stakeholders were grouped together (Heath, Agriculture, Livestock and Fisheries (including horticulture and biofortification), Education and School Feeding, Social Protection, Private Sector and Food Fortification and Demand

Creation/Social Behaviour Change Communication) and discussed the preliminary FNG findings and prioritised actions relevant to their sector. Each discussion group was provided with a set of instructions and questions (see appendix 3) to consider during their discussion.
The outcome of the discussion, was the identification of sector-specific recommendations to address access to nutritious foods (see figure 5) and entry points and key steps to be carried out to deliver on the defined recommendations. An overview of the prioritised recommendations is provided in appendix 4.


Appendix Figure 6: Sector-Specific working groups discussing the FNG findings and interventions



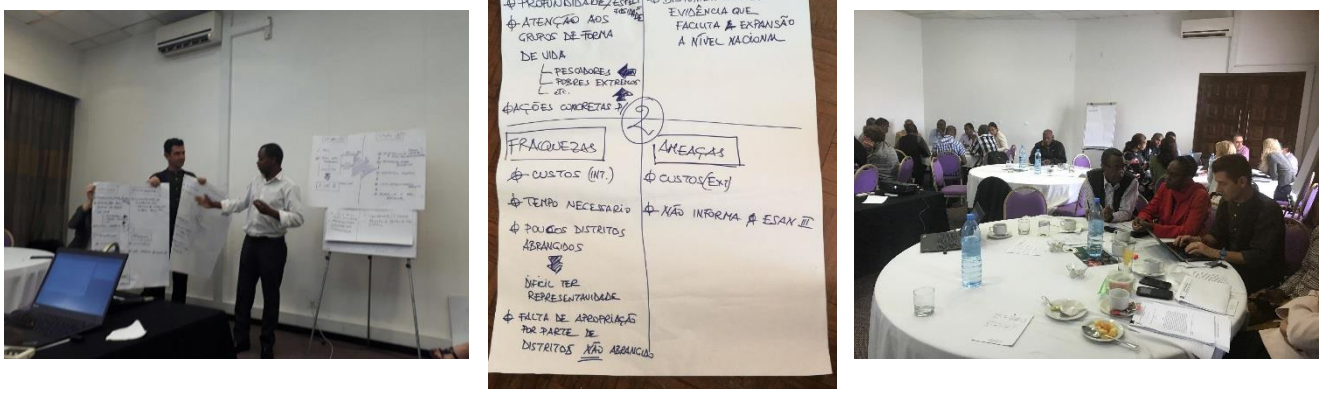
Appendix Figure 7: Examples of recommendations developed by the sector-specific working groups

5) Workshop Session 2: Determining primary data collection models

During this discussion, six scenarios for primary data collection were presented (see appendix 5). These were based on sampling at district, cluster of districts or provincial level, with varying coverage of either the entire country or only the north. Working in groups, participants discussed which scenario they considered to be best for further analysis, considering the level of detail the analysis would provide, the time required and the cost.
Considering the goal of completing the FNG process in quarter one of 2018. Participants suggested that it may be preferable to conduct a deeper analysis of the existing data (IOF 2015), which was considered sufficiently complete and robust, and revisit primary data collection at a later date based on the results.
There were four groups and each conducted a SWOT (strengths, weaknesses, opportunities, and threats) analysis to decide if the FNG should proceed with:

- Option 1: Conduct additional data collection (using one of the six data collection scenarios presented) in the months to follow (2017) or;
- Option 2: Conduct deeper analysis with the existing data from IOF 2015 (no additional primary data collection in 2017).

Participants highlighted the trade-off between having more geographically-specific data (with sampling at the district or clustered district level) and more recent data with option 1 or, conducting a more thorough analysis of existing data at less expense cost, and a sufficient timeline to deliver full results in quarter 1 of 2018, that would be valuable to inform the development of ESAN III.
Each group presented their discussion and scenario, and these were then anonymously voted for. The scenario that obtained the most votes, 15 out of 24, was a hybrid solution of option 1 and option 2, that involved a deeper analysis of the existing IOF 2015 data to be delivered by quarter 1 of 2018 as the next phase and then, based on the results of the deeper analysis, and resource availability, revisiting primary data collection in a follow-up workshop with stakeholders to determine the best approach for further data collection.



Appendix Figure 8:: Working groups discussing and presenting their proposed options for further FNG analysis

6) Next Steps

It was decided that intervention modelling should be carried out for all provinces using the existing IOF dataset, only. Stakeholders agreed that, in order to ensure that the deeper analysis was as relevant as possible for decision making, that they would review the list of interventions to be modelled in each province, as well as the details, entry points and target groups for these interventions and give feedback. The stakeholders also agreed that the analysis should be completed in early 2018 and be delivered as part of a technical workshop to discuss and use the information to inform decision making at provincial, as well as national level.

To enable this the next steps of the FNG process for Mozambique were agreed as being:

1. To, with stakeholder support, revise the list of interventions for modelling for each of the provinces, incorporating feedback from the workshop and gathering additional data on interventions where required.
2. To consult with all stakeholders to review the intervention list by sector and jointly identify:
   - Further interventions to be modelled (and data needed to model these) or alterations to the listed interventions (such as changes to price, nutrient content, serving / dose / frequency / amount of transfer).
   - Interventions that do not need to be modelled.
   - Specific interventions for modelling only in selected provinces.
3. To undertake interviews with provincial stakeholders, to collect information on specific interventions to model in only those provinces.
4. To complete the intervention modelling for all provinces, using CotD analysis.
5. To prepare a Mozambique FNG draft report for review by the stakeholders.
6. To arrange a workshop in February 2018 to present the final, province-specific findings of the FNG to stakeholders and, jointly develop sector-specific, and where appropriate, province-specific recommendations, for filling the nutrient gap (see proposed outline Figure 7).
7. To incorporate the February 2018 workshop outcomes into the draft FNG report and finalise, with stakeholder input, the FNG Mozambique report.
8. To arrange a national launch of the FNG Mozambique report.
9. To re-allocate the funding destined for primary data collection to other complementary uses, such as, for instance, spot-checks on the IOF data (confirmation purpose), more intense dissemination of the FNG advocacy results to ensure ownership at province level, and/or foment cost-effective analysis studies to be undertaken by other partners.

Appendix Figure 9: Proposed Outline

Proposed Outline: Workshop to present and discuss FINAL, province-level findings of the Mozambique Fill the Nutrient Gap Analysis
Objectives - Discuss in detail the implications of the FNG findings at the province-level, in terms of needs identified, possible solutions/responses and the results of the intervention modelling in terms of potential to impact the cost and affordability of nutritious diets - Prioritise by sector and (if possible) by province, actions that should be taken in the short, medium and long term to respond to the identified nutrient gaps - Develop by sector and (if possible) by province, recommendations for improving access to nutritious foods, inclusive of interventions, target groups, entry points and actions - Use prioritised recommendations to inform planning as part of the implementation strategy of ESAN III - Share the complementary inputs from the spot-checks of the IOF data - Increase the buy-in from Province level stakeholders
Main Agenda Points

1. Overview of the FNG methods and FNG process in Mozambique
2. Introduction to/overview of ESAN III – *By Setsan*
3. Presentation of the key findings from the secondary data analysis – National Level
4. Presentation of the CotD analysis and Intervention modelling by region, pairing linear programming findings with insights from the secondary data analysis
    a. Northern Provinces
    b. Central Provinces
    c. Southern Provinces
5. First Workshop components of the event – division of participants by sector and province/region to
    - Discuss how the FNG findings relate to the specific sector and area
    - Discuss the feasibility and acceptability of and prioritise interventions, entry points and transfer modalities
    - Define a number (usually up to three) of context specific recommendations for actions and interventions that the sector will engage in, in order to fill the nutrient gap
    - Determine specific target groups - with a focus on children under 2 years of age, adolescent girls and pregnant and lactating women – will be reached and the entry point/s for each action/intervention
    - Determine key steps necessary and stakeholder engagement needed for each action/intervention to be fully implemented.
6. Participatory feedback and discussion of working group products for larger group discussion
7. Second Workshop component of this event – Garnering necessary commitment and funding for the actions and interventions prioritised
8. Final workshop component – Jointly agreeing on overarching policy and programme recommendations by sector
9. Agreement on next steps

Expected Participants will be the GT PAMRDC members, National Implementation Team of the FNG, SETSAN Focal Points from Provinces, etc.

Expected Outputs to be discussed in detail with SETSAN and the FNG National Implementation Team

Outputs from workshops in other FNG countries have included:

- Detailed presentations from representative sectors that list interventions that have been prioritised as a result of the FNG workshop discussions, entry points and target groups for these interventions, key activities in the short, medium and long term, stakeholders to engage with and any set up activities needed (advocacy, preparation of budgets, pilot projects, fundraising)
- Province-level prioritisation and planning of interventions by sector
- Commitment of time and resources to holding specific planning meetings to make the case for budget allocation towards the interventions prioritized during the FNG workshops
- Contributions, including direction and evidence, towards the development or finalization of multi-sectorial nutrition policies and strategies at the national level

7) Appendix

1. List of stakeholder institutions represented by participants at the October 2nd Workshop

- Agricultural Research Institute of Mozambique (IIAM in Portuguese)
- Danish International Development Agency (DANIDA)
- European Union (EU)
- Food and Agriculture Organisation of the United Nations (FAO)
- Foundation for Community Development (FDC in Portuguese)
- Global Alliance for Improved Nutrition (GAIN)
- Intellica
- International Fund for Agricultural Development (IFAD)
- International Potato Centre (CIP in Portuguese)
- Irish Department of Foreign Affairs and Trade (Irish Aid)
- Ministry of Agriculture and Food Security (MASA in Portuguese)
- National Institute for Social Protection (INAS in Portuguese)
- National Institute of Health –Ministry of Health (INS-MISAU)
- Nutrition International (NI)
- Technical Secretariat for Food Security and Nutrition (SETSAN in Portuguese), Maputo, Cabo Delgado, Manica & Sofala
- UK Department for International development (DFID)
- United Nation's World Food Programme (WFP)
- United Nations International Children's Fund (UNICEF)
- United States Agency for International Development (USAID)
- Women, Gender and Development (MUGEDE)

2. Workshop Agenda

Time	Agenda Item	Person/s responsible
08:00	Arrival and registration of participants	Administration
8:30	Welcome Remarks	Edna Possolo/SETSAN / António Paulo / SETSAN
8:50	Introduction of Participants	Participants
9:00	Introduction to FNG and the FNG Process in Mozambique	WFP CO and HQ
9:20	Presentation of FNG preliminary findings for discussion	WFP CO and HQ
10:30	**Tea/ coffee break**	
10:50	Introduction to group work objectives and brief example for how FNG results were used to identify recommendations in other countries	WFP CO and HQ
11:00	**Group work** All stakeholders participating in the FNG workshop will decide group work participation based on which sector specific work group they feel is most relevant to their area of expertise, work focus or interest area. Tools and instructions will be provided by the small group facilitator. Groups will have 1.5 hours to complete their activity and then 10 minutes each to present their decisions and conclusions to the workshop. Each group will allocate a rapporteur, from amongst the group members, who will both fill in the electronic worksheet and feedback the workgroup's recommendations to the larger group Small working groups by sector: o Health o Agriculture & Fisheries (inc. biofortification) o Education and school feeding	Working Group Facilitators

	○ Social protection ○ Private sector (markets) and food fortification ○ Demand creation and social behaviour change communication ○ Water, Sanitation and Hygiene ○ Food Industry and Trade Groups will discuss and prioritise interventions and actions to fill the nutrient gap in light of the FNG findings, taking different contexts into account. Participants will also consider whom they would need to work with in order to achieve desired outcomes, what conditions will be needed to be in place for this to occur and scalability. Finally, participants will be asked to consider what, if any, information they may need to make decisions on or plan/implement these interventions.	
12:30	**Lunch break**	
13:30	Presentations from working groups (10 minutes each) and plenary discussion to decide on final sector-specific recommendations	Workshop Participants
15:15	Summary of prioritised recommendations and brief discussion	WFP CO and HQ
15:30	**Tea/ coffee break**	
15:50	Explanation of the general methods for primary data collection to provide further modeling granularity. Ensure participants understand a) What sort of data would be collected b) What sort of information the data collection and further modeling would provide **and** what it *would not* provide (limitations) c) Limitations in terms of how many areas can be realistically sampled Discussion regarding objectives and scope of primary data collection and definition of locations	Filippo Dibari
16:45	Closing Remarks, including next steps	Edna Possolo/SETSAN or António Paulo / SETSAN
17:00	**Close**	

3. Key instructions for working groups as part of session 1

1. Discuss how the FNG findings relate to the specific sector of the working group
2. Discuss the feasibility and acceptability of and prioritise interventions, entry points and transfer modalities
3. Define a number (usually up to three) of country and context specific recommendations for actions and interventions that the sector will engage in, in order to fill the nutrient gap
4. Determine which actions and interventions (defined in 2 above) will reach which specific target group - with a focus on children under 2 years of age, adolescent girls and pregnant and lactating women
5. Determine the entry point/s for each action/intervention
6. Determine key steps necessary for each action/intervention to be fully implemented. This can be broken down into the short, medium and long-term steps required.
7. Give due consideration to identifying all stakeholders that would need to be engaged, in order to ensure that the action/intervention and considered steps are achieved.
8. Discuss further information that may be necessary to make decisions or plan interventions in different contexts
9. Complete and hand in the electronic worksheet (provided as a template).
10. Feedback (6 minutes) the sectors recommendations to the larger group for discussion.

4. Sector specific recommendations and prioritised activities

Recommendations	Target Groups	Entry Points	Key Activities	Stakeholders to Engage With
Social and Behaviour Change Communication				
Prioritise harmonised SBCC messages to improve diets for infants and children, women and adolescent girls at community level	- Adolescent Girls - Young Mothers of Children under 1000 days (Window of Hope)	- Peer Communication - Schools - Health Centres - Community and religious groups and Leaders	1. Identify existing communication strategies (compatible/reflecting programme priorities and messages) 2. Discuss with main stakeholders actual implementation plan (time frame, pilots, costs, monitoring and evaluation mechanism) 3. Identify needs to harmonize messages and interventions at national/provincial/district/community level 4. Identify existing or potential stakeholders at community level (social mapping) 5. Identify potential cultural and behavior barrios at community level (formative research) 6. Integrate social mapping information and formative research findings into new or existing strategies identified 7. Inclusion of improved nutrition package in the agenda of national provincial nutrition committees.	- Education system - Health system - Recipients themselves - Community and local leaders
Social Protection				
Improving and defining data collection at the district and province level to inform prioritisation and monitoring Incorporate packages of nutrition-specific elements in to social protection, informed by FNG results	Households with children of 0-5 years	PSSB + PASD	<u>Short Term</u> 1. Identify and prioritise key target groups (in theory all target groups should be the same in all provinces); however, within province each package will be refined to match the cluster of districts 2. The approach must be community driven 3. FNG to define the value of the intervention package for advocacy purposes 4. Improve the basic basket by making it more nutrition specific/ sensitive	Provincial government District level administrators Communities NGOs (E.g. Save the Children, WV) • Based on provinces • Note: a lot of them tend to work individually Donors: EU, USAID, IRISH AID,DFID, UN(UNICEF,FAO,WFP)
	Households with Adolescents	PASD		
	Vulnerable pregnant women	PASD		
	Lactating women	PASD		
	Elderly that live with children	PSSB		
	Households led by children	PSSB		

Recommendations	Target Groups	Entry Points	Key Activities	Stakeholders to Engage With
	Households led by teenagers	PSSB	5. Merge this basic basket with consumption profile of each province with a nutrition focus <u>Medium Term</u> 6. Integration of various existing social assistance programmes (complementary programming) <u>Long Term</u> 7. Lack of M&E on the impact of quality of life of the programme- failure to achieve this aspect in actual policies	Private Sector • Processing of the products that can be offered for social protection
Private Sector (Markets) and Food Fortification				
Engage with the private sector to support and facilitate development and commercialisation of nutritious foods	Households	Markets Industry Networks	1. Facilitate the process of incorporation of companies 2. Increase fiscal benefits for the production of nutritious foods 3. Lower financial costs (e.g. reduction of production costs for the private sector – lower taxes) 4. M&E of fortification policy in the private sector/ quality of fortified products 5. Protection policies for locally produced foods 6. Increase the production of material for fortification (oil, corn flour/wheat flour and salt)	MIC; MASA; business associations in general (CTA,AMA) and the private sector (Production of eggs and chickens,[*magoeira*], Horticulture, etc.
Agriculture and Fisheries				
Invest in, promote and proliferate improved technologies and methods using community-level extension and support	- Small scale producers with focus on female household heads	Agriculture extension services Academia/Research Private Sector	Transfers of resilient agriculture technologies Extension of areas of production associated with irrigation promotion Increase the investment in agro-processing technologies and conservation Promote the construction and use of storage facilities Promote the transference of technology in material of handling and conservation of production Efficiently associate programs with a focus on dietary education and nutrition Facilitate access to markets for the flow of consumption Promote bio fortified foods Training of extensionists and producers Mobilization of financial resources Construction of infrastructures of support and production (cold stores, access to roads and infrastructures, markets extension of energy Creation of multisectorial coordination of programs	IIAM IIP

Recommendations	Target Groups	Entry Points	Key Activities	Stakeholders to Engage With
Health				
Prevent early pregnancies and incentivise school attendance to protect adolescent girl's nutritional status and future generations	Adolescent girls (10-19 years old)	Schools Health System Community Leaders Health System	Prevention of early pregnancies • Increase consciousness about early pregnancy and family planning (better access to modern contraceptives); • Reinforcement of the law against early pregnancy; • Involvement of community leaders in the communication regarding early pregnancy; • Creation of vouchers to increase the retention of adolescents in school (school lunches, school material, uniforms) Supplementation in the community and school level(s) (fortified salt,…) taking into account the availability (iron)	Ministry of Health Ministry of Education Ministry of Women and Social Protection Ministry of Economy and Finance SBCC partners (radio, etc.) International development partners (NGOs, etc.)
Promotion of nutrition practices	Children 0-24 months		Exclusive breast feeding • Social Behavior Change Communication • Taking into account the cultural practice by recommending both local and complimentary foods. • Involvement of nurses and nutritionists (focus on the monitoring of growth, weight and height, MUAC), nutrition evaluation, following of protocol Involvement of APEs in the discourse of chronic malnutrition: use of community mobilization to improve access to desired results.	
	Pregnant and Lactating Women		Social and Community Mobilization • Involvement of community leaders (in regular community meetings) • Increase the use of social communication (radios, health programmes, nutrition and others) Supplementation of folic acid and micronutrient supplements Malaria Prevention • Communication to reinforce the use of mosquito nets, TIP) Strengthening supplementation laws	

5. Scenarios for primary data collection

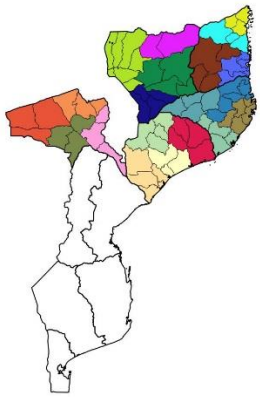
During the workshop six scenarios (ANNEX) for primary data collection were presented, based on sampling at the district, cluster of districts or province level, with varying coverage of either the entire country or only the North. Participants discussed which scenario would be best for continued analysis, with consideration for the level of detail the analysis would provide, time needed and cost.
When the goal of completing the FNG process in Q1 2018 was discussed participants suggested it may be better to conduct deeper analysis of existing data (IOF 2015) and revisit primary data collection at a later date based on the results.
Four groups conducted SWOT analysis as to whether or not the FNG should proceed with: option 1) conduct additional data collection (using one of the six data collection scenarios presented) or option 2) conduct deeper analysis with the existing data from IOF 2015. Participants highlighted the trade-off between having more geographically-specific data (with sampling at the district or clustered district level) and more recent data with option 1 or conducting a more thorough analysis of existing data for less cost and enough time to deliver full results in Q1 2018, to inform the development of ESAN III.
Four groups presented scenarios that were voted upon anonymously by workshop participants. The winning scenario, with 15 out of 24 votes was a hybrid solution involving a deeper analysis of existing IOF 2015 data to be delivered by Q1 2018 as the next phase and then based on the results of the deeper analysis, revisiting primary data collection in a follow-up workshop with the stakeholder group to decide the best approach to further data collection.
Annex:
Scenario 1: Conduct market price data collection in all districts. This scenario would be the most thorough but would require a lot of time and resources.

Scenario 2: Conduct market price data collection representative of all provinces. This scenario would cover the complete country at the provincial level but would not capture variations within provinces.

Scenario 3: Conduct market price data collection representative of all five Northern provinces. This scenario would only cover the North and would not capture variations within provinces. It would require less time and fewer resources.

Scenario 4: Conduct market price data collection representative of clusters of districts throughout the country. This scenario would cover the entire country and would capture some variations within provinces. It would require a considerable amount of time and resources.

Scenario 5: Conduct market price data collection representative of clusters of districts in the five Northern provinces only. This scenario would only cover the North and would capture some variation within provinces. It would require less time and fewer resources than scenario 4.



Scenario 6: Conduct market price data collection representative of clusters of districts in the five Northern provinces and representative at the provincial level in the six Southern provinces, including Maputo. This scenario would cover the entire country and would capture variation within provinces in the Northern provinces. It would require less time and fewer resources than scenario 4 and more time and resources than scenario 5.