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Comprehensive Food Security and Vulnerability Analysis (CFSVA)

Ethiopia
2019

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FOREWORD

Ethiopia has made tremendous socio-economic progress over the past two decades. The country has reduced the proportion of people living below the poverty line, significantly reduced the prevalence of hunger and undernourishment, and expanded access to basic services. However, poverty and food insecurity are still widespread, and millions of Ethiopians are poor and inadequately fed; a very large number of these people are outright hungry and on welfare assistance. Drought is an immediate cause of food insecurity in rural areas, since it has a serious implication for food availability and access. Consecutive droughts in many parts of the country have depleted households' resilience to shocks and weakened coping capacity. The root causes of food insecurity in Ethiopia include structural factors such as degradation of the natural environment, population pressure that resulted in land fragmentation and land-per-capita decline, backward agricultural technology/poor performance of agricultural sector and land policy, limited opportunity for diversification of income sources, unemployment and, linked to the aforementioned, the wider economic factor of basic poverty.

Understanding the factors that lead to food insecurity and households' vulnerability to shocks is of paramount importance in informing policy and programme design and implementation. The World Food Programme (WFP), in partnership with Central Statistics Agency (CSA) of Ethiopia, conducted a Comprehensive Food Security and Vulnerability Analysis (CFSVA). The aim was to understand the profile of food-insecure households in the country, the economic vulnerability which led to household food insecurity, and the geographic distribution and number of the food-insecure people.

This is the second round of WFP/CSA collaboration on the CFSVA. WFP food-security, data-collection modules were incorporated into CSA's Welfare Monitoring (WMS), and an agreement was made to use CSA's Household Consumption Expenditure Survey (HCES) and DHS data for the analysis of household consumption expenditure and the nutrition situation which is part of this CFSVA.

CSA staff were trained in food security analysis, and staff from both agencies participated in data analysis. This builds national capacity within both the CSA and WFP.

The dataset from WMS, HCES and DHS makes the CFSVA analysis highly comprehensive and informative for policymakers and programme designers and implementers. WFP Food Security Analysis tools was used to classify households into different food security groups.

The CSA staff, namely Hagos Haile, Kassu Gebeyehu, Kiflu Tesfaye, Salah Yousuf, Seid Jemal, and Zena Selassie Seyoum (in alphabetic order), coordinated and supervised data collection, cleaned the data and carried out primary data analysis. WFP Ethiopia Country Office VAM team – Alemtsehai Alemu, Mamo Getahun and Tsegazeab Bezabih conducted an in-depth analysis and wrote the CFSVA report.

WFP and CSA duly acknowledge the contributions of above-mentioned professionals and would like to extend a sincere appreciation to all who contributed to this analysis. Thanks, are also due to the WFP Regional Bureau (RBN) Vulnerability Analysis and Mapping (VAM), and Nutrition, staff: Krishna Pahari, Geophrey Sikei, Aaron Wise and Jo Jacobsen, for their guidance and editing of the draft document. We would also like to thank Claude Kakule, for his technical guidance, Alexandra Priebe, for her copy editing, and Abiy Wogderes for preparing the maps in the report.

Special thanks should be given to Cinzia Monetta, Food Security Analyst, OSZAF, WFP headquarters for her support in Government staff training and technical support in data analysis and editing of the draft report.

WFP thanks CSA for partnering on food security analysis and trusts this kind of collaboration willcontinue to better deliver the analytical needs for better policy design and programme development.
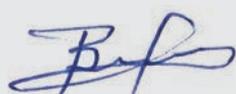
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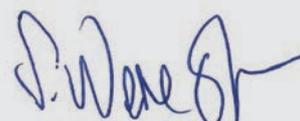
Steven Were Omamo
Representative and Country Director,
WFP Ethiopia

Comprehensive Food Security and Vulnerability Analysis (CFSVA)

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Executive Summary

Central Statistical Agency

The Comprehensive Food Security and Vulnerability Analysis (CFSVA) is aims to explore the state of food and nutrition insecurity, identify the most vulnerable groups to food insecurity, examine the spatial distribution of food insecurity in Ethiopia and identify the driving factors to vulnerability to food and nutrition insecurity. This report is based primarily on analysis of the Welfare Monitoring Survey (WMS), the Household Consumption and Expenditure Survey (HCES), and the Demographic and Health Survey (DHS) conducted in 2015/16. A food security module was incorporated into the WMS questionnaire to collect data on different food security indicators, as per the agreement between Central Statistical Agency (CSA) and World Food Programme (WFP). The data were collected from approximately 30,229 households across the country. During analysis, the state of household food insecurity was assessed using four approaches: 1) the Consolidated Approach for Reporting on Food Security Indicators (CARI), which classifies households into food secure and food insecure; 2) food energy consumption, which measures quantity of food household members consumed; 3) the Dietary Diversity Score, which measures the quality/diversity of food consumed by members of the household; and 4) the Food Consumption Score (FCS), which measures dietary adequacy. Economic vulnerability of household to food insecurity was also analysed proxy indicators, such as poverty (food and general poverty), the Wealth Index, and household food expenditure.
Anthropometric measures, such as height for age (stunting), weight for height (wasting) and underweight (low weight for age), were analysed to provide insight into the nutritional status of children, aged 6-59 months, using DHS data. For non-pregnant women in the reproductive ages (15-49), body mass index (BMI) was applied to estimate the prevalence of under- and overweight.

State of Food Security in Ethiopia

Approximately 20.5 percent of households are estimated to be food insecure in 2016.
At individual level, the proportion of food insecure persons stood at 25.5 percent. This directly translates into approximately 26 million food insecure people . The number of food insecure could have been much higher had food assistance not been provided to around 18 million people through emergency food assistance and productive safety net programme.

Amhara Region experienced the highest percentage of food insecure households (36.1 percent), followed by Afar (26.1 percent) and Tigray (24.7 percent). Nearly 22.7 percent of rural households and 13.9 percent of urban households are food insecure. Overall, rural households are more food insecure than urban households according to all indicators except calorie deficiency.

The proportion of households who have inadequate caloric consumption (<2,550 Kcals per adult equivalent per day) constitutes 31 percent of the total households in Ethiopia, with 24 percent located in urban areas and 33 percent in rural areas.
Additionally, mean energy consumption has increased 54 percent since 1996, currently standing at 3,008 Kcal per adult equivalent per day nationally (2016).

The share of starchy staples in total calorie consumption is very high at 71.4 percent indicating a highly unvaried diet.
On the average, adults consume 194 kg of cereals per year, which comprises 60.4 percent of the total calorie intake. In 2016, the average annual consumption of maize stood at 66.7 kg per adult equivalent, which constitutes nearly 20 percent of the total calorie intake in the country. Teff, sorghum, and wheat account for 12 percent, 10 percent and 9 percent of overall calories consumed, respectively. Maize remains the primary calorie source for the poor, while teff is the primary calorie source for the higher wealth quintiles. The share of sorghum and wheat, as calorie sources, is dominant in rural Ethiopia as compared to urban areas and nearly the same among the lower four expenditure quintiles (Q1 to Q4). The most important calorie sources in urban areas are primarily teff, oils and fats, constituting more than 40 percent of the calorie intake. From 1996 to 2016, the consumption of cereals has increased but at a decelerating rate. While the average per adult equivalent quantities of starchy staples consumed has increased over the past two decades, the share of the calories has steadily decreased.

The per capita milk and meat consumption of Ethiopian adults is far below their counterparts in surrounding sub-Saharan countries.
The per capita milk consumption level in Ethiopia is around 16.6 kg per year. Pastoral and agro-pastoral regions of Somali and Afar have relatively higher per adult equivalent dairy products consumption as compared to other regions. Additionally, the average Ethiopian adult consumes 7.5 kg of meat per year (6.1 kg per

capita. The consumption of animal products, including meat, poultry, fish, eggs, milk and dairy products, has increased 65 percent over the last two decades while consumption of pulses stagnated in a general downward trend.

Per capita vegetable consumption in Ethiopia stands at 50.2 kg per year, with the average adult consuming 61 kg of vegetables.

The consumption of vegetables is relatively high in SNNPR and Gambella. The consumption of fruits is around 3.5 kg per adult or per capita 2.9 kg per person. Compared to the WHO recommendations of vegetable and fruits consumption, which is around 400g per day per person (146 kg per person per year), the average Ethiopian meet only 36.4 percent of the recommendation. However, there has been a two-fold in the quantity of fruits and vegetables consumed by an average adult from around 31 kg in 1996 to 64.4 kg in 2016.

Approximately 54 percent of households consume four or fewer food groups out of seven during the seven days prior to the date of interview and 18 percent three or fewer.

A higher proportion of rural households consumed less diverse diets as compared with urban households (21.4 percent versus 7 percent consumed three or fewer food groups). Somali Region (56 percent), followed by Afar (41 percent) and SNNPR (23 percent), have the highest percent of households consuming three or fewer food groups.

On average, meat and fruit groups are consumed by households less than one day a week.

Urban households have a higher consumption of fruits, meat, oil and sugar groups on average, whereas rural households report higher consumption of dairy products. Households' consumption of diversified food (quality foods) tend to increase as their wealth quintile group increases with the exception milk and dairy product consumption. Households in the poorest wealth quintile report the highest mean number of days with the consumption of milk and dairy products. This indicates that household milk consumption in Ethiopia is associated with the livelihood of the community rather than household wealth.

Nearly one in four households (23 percent) had inadequate food consumption during the seven days prior to the date of interview,

i.e., consumed less than the acceptable variety of foods and/or only consumed foods with less nutritional values (poor micronutrient, low-quality protein) and nearly one in three (31

percent) reported consuming energy deficient food. The proportion of households with inadequate food consumption was higher in rural areas (25 percent) as compared to the urban areas (14 percent). SNNPR had the highest percentage of households with inadequate consumption at 46 percent followed by Afar (30.6 percent).

Profile of the food Insecure:

Larger household size, lower level of educational attainment of the household head, and increase in the age of the household head are significantly associated with household food insecurity.

Household food insecurity is positively correlated with an increase in household size. There is an inverse relationship between the level of education attained by the head household and the likelihood of falling into food insecurity. A higher proportion of house-holds headed by persons that can read and write were found to be better-off, in terms of food poverty and food security, as compared to those with heads of household who are illiterate. Food poverty is significantly lower among the young age group (7.9 percent) but sharply increases in the prime age group (20.5 percent) followed by a slight decrease in the old age category (18.8 percent). Adjusted analysis suggested that sex of the household head is not a significant predictor of food insecurity, as measured by food poverty and CARI.

Households that are income and asset poor, reside in rural areas, and those located in highland agro-ecology zones tend to experience higher levels of food insecurity.

Poor households are over represented in the food insecure category compared to the non-poor households across all food insecurity measures. Households with higher asset and wealth have a greater likelihood of food security as compared with households with lower assets and wealth.

Food insecurity is relatively high among house-holds engaged in the informal sector, mixed agriculture, and casual labour.

Households that earn their living from agricultural activities (crop and livestock) are generally the most food poor as compared with other households. Households engaging in for-mal trade (including wholesale, retail and service), service trade, and salary paying jobs are more food secure as measured by food poverty, FCS, and CARI.

Economic vulnerability to food insecurity

One in four (24.8 percent) households in Ethiopia fall under food poverty line, suggesting that they are unable to meet the recommended daily calorie requirements. Food poverty also remains substantially higher in rural Ethiopia (27.1 percent) as compared to urban Ethiopia (15.2 percent). Regionally, Addis Ababa, Harari, Tigray, and Dire Dawa, have the lowest percentage of households in the poorest quintile of wealth index. While pastoralist and agro-pastoralist regions, Somali and Afar, have the highest percentage of households in the poorest quintiles.

The proportion of household expenditure on food in Ethiopia trended downward from 65 percent in 2000 to 51 percent in 2016. Vulnerability to food insecurity is predominately a rural phenomenon with more than 32 percent of rural households spend more than 65 percent of their expenditure on food compared to 18 percent of their urban counterparts.

Nutritional status of Children and Women

The prevalence of stunting among children under-five years decreased from 58 percent in 2000 to 38.4 percent in 2016. Regardless, two out of every five (nearly 5.8million) children under-five are stunted. The prevalence of severe stunting is 18 percent. Rural areas experience higher rates of stunting (39.9 percent) as compared with urban areas (25.4 percent). Regionally, the highest prevalence is found in Amhara (46.3 percent), followed by Benishangul Gumuz (42.7 percent) and Afar (41.1 percent).

Acute malnutrition or prevalence of wasting among children under-five stands at 10 percent. This means that nearly 1.52 million under-five children are too thin to their height, an indicator of acute malnutrition. Both Afar and Somali Regions exceed the 15 percent critical public health emergency threshold for wasting. 22.3 percent of women in the reproductive age (15-49 years) are un-derweight (18.5 >BMI). The highest proportion of underweight in women is observed in Afar (39.1 percent), followed by Tigray (34 percent), Gambella (31.8) and Somali (31.2 percent). Acute malnutrition is more prevalent in rural Ethiopia (10.1 percent) as compared to urban Ethiopia(8.7 percent). The prevalence of underweight among

children under-five shows a consistent decline from 41 percent in 2000 to 24 percent in 2016. According to the WHO classification, this is considered as "serious". Some 70 percent of the women fall under the "normal" BMI category, which is between 18.5 and 25 BMI, while 22.3 percent are underweight (18.5 >BMI) as a result of inadequate energy intake and/or diseases.

Shocks, coping strategies and perceptions of food insecurity

Trend analysis shows clear seasonal patterns in food shortages with a decrease in the proportion of households reported food short-age from August to January following the harvest season and then a steady
increase from February to July following the lean season.
The highest proportion of households report food shortages in July. Crop failure is a major shock with 7 percent of households reporting that they had faced shocks during the last 12 months prior to the date of interview, followed by a reduced income of households (3.5 percent). Of the 10.4 percent of households that reported that they had faced a food shortage during the last 12 months, approximately 76 percent had a shortage for one to four months. One in two households (52 percent) reported that their food shortage lasted two to three months while one in five households reported they experienced food shortage for five to eight months. Each reduced coping strategy was used by more than 80 percent of households when experiencing shocks to fend off the major shocks experienced during the reporting period.

Nearly 28 percent (4.1 percent much worse and 23.9 percent worse) of households
nationally perceive that their standard of living with respect to food has declined as compared to the year previous, while 41.7 percent perceive it remained the same.
As compared to the last five years prior to the date of interview, approximately 29 percent (10 percent much worse and 19 percent worse) household perceived their living standards with respect to food much worse and 25.6 percent perceived their living standards remained the same.

Conclusion and Recommendations

• On average, the quantity of food consumed per adult equivalent and calories consumed have increased considerably over time, but not for everybody.

• However, the share of starchy staples in total calorie consumption is very high at 71.4 percent indicating a highly unvaried diet, despite the increase in average calorie consumption.

• The proportion of the population who lives below the food poverty line has declined over time but is still high. Approximately 20.5 percent of households were estimated to be food insecure during the survey period. Geographic distribution of food insecurity shows rural households were more food insecure than urban households by all indicators except calorie deficiency.

• Income and assets were found to be key determinants of food insecurity and demographic factors were important drivers of food insecurity of food insecurity.

• Promote alternative, nutrition sensitive livelihood development programs that provide more stable sources of income and develop and diversify livelihood opportunities.

• Increase nutrition sensitive safety nets and pro-poor growth initiatives tailored to specific needs in urban and rural areas, to promote income generation and asset acquisition.

• Advocate for better child nutrition, encouraging a higher diversity of food items consumed and a higher frequency of meals.

• Ensure that non-nutrition specific programmes such as livelihoods, climate change, school feeding, and most of all social protection include a nutrition-sensitive component

• Design and expand social safety net, index insurances, mandatory saving and establish social scheme through co-funding

• Continue to scale up and implement seasonal interventions to help households experiencing seasonal food insecurity and ensure that transfer programmes take seasonal peaks of food insecurity into account.

Introduction

Background

World Food Programme (WFP), in collaboration with host governments, has been conducting a Comprehensive Food Security and Vulnerability Analysis (CFSVA) in different countries with the objective of measuring the extent and depth of food and nutrition insecurity. Food security defines a situation in which all people at all times have physical and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life.[1] This depends upon food being available in sufficient quantity and quality and communities, households and individuals having enough resources to access it, mainly through purchase and home production. Even if food is available and can be accessed, inadequate utilisation leads to malnutrition. Proper child care, providing a diet with enough energy and nutrients, safe drinking water, adequate sanitation as well as knowledge of food storage, processing, illness management and basic nutrition, are essential to achieving adequate food utilisation.

This CFSVA is the second-round report conducted in Ethiopia intended to assess multifaceted aspects of food security. The first round was conducted using the 2011 Welfare Monitoring Survey (WMS) and Household Consumption Expenditure (HCE) surveys. As in the previous round, the second-round report was made available based on the agreement entered between WFP and CSA to conduct a CFSVA making use of the nationwide, multi-topic WMS and HCE surveys. Accordingly, food security modules were incorporated into the WMS questionnaires, which provided unique opportunity to conduct rigorous analysis of the levels of food insecurity and its underlying causes

Rationale and Objectives

The overall objective of this CFSVA is to provide analysis of food security and vulnerability to food insecurity of the Ethiopian population. This analysis is to be used by policy makers, planners, and other decision makers towards tackling food insecurity in Ethiopia. This report aims to give a county level and regional level overview of food security and nutrition in Ethiopia. Specifically, the CFSVA intended to answer the following key questions:
• What is the comparative state of food security and nutrition in Ethiopian rural and urban households?

• How many people are food insecure or are at risk of becoming so?
• What is the profile of the food insecure?
• Are there geographic patterns in vulnerability, i.e. worse and better off areas?

Country Context

Land, People and Space: An Overview

Ethiopia is the 27th largest country in the world with a total size of 1,126,829 square kilometers. Its neighboring countries in East Africa include Sudan and South Sudan to the west, Djibouti and Eritrea to the north, Djibouti and Somalia to the east and Kenya to the south. Currently, Ethiopia is divided into nine national regional states: Oromia, Amhara, Tigray, SNNPR, Afar, Benishangul-Gumuz, Gambela, Harari, Somali; and two chartered cities: Addis Ababa and Dire Dawa. The great diversity of terrain in the country results in wide variations in climate, soils, natural vegetation, and settlement patterns. The agro-ecological environment in Ethiopia is highly diverse but generally divided into wurch (alpine), dega (highland altitude), woyna-dega (mid-land altitude) and qola (lowland).

Temperature and rainfall are the most important climatic factors that influenced agricultural production, pattern of settlement, activities and life of the rural population in the country. The midlands and high lands are predominantly characterized as mixed farming systems, where livestock and crop production are almost equally important and highly integrated. The lowlands, particularly the east, south east,

Figure 1.1: Regional map of Ethiopia

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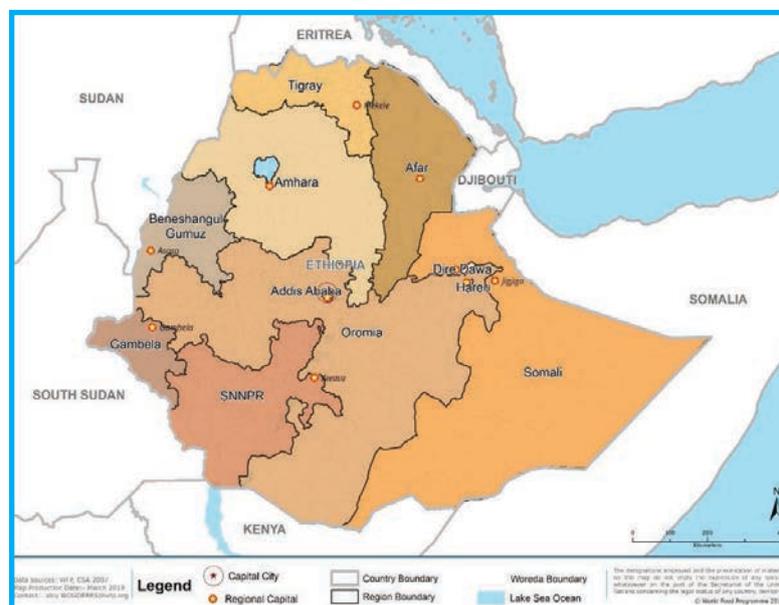
and the north east, have much lower levels of precipitation. Temperature can vary between annual means of 34.5° C in the Denakil Depression, to a mean of below 0° C in the Mt Ras Dejen.[2] From time to time, there is an increasing tendency of extreme weather conditions, including drought, flooding, heavy rains, strong winds, frost, heat waves, etc. Drought is a recurrent threat to rural livelihoods and the economy as a whole.

With an estimated population of 102.4 million in 2016, Ethiopia is the second largest population in Africa, next to Nigeria, and the most populous landlocked country in the world.[3] The rural population constituted 80.1 percent, while the remaining 19.9 percent were urban residents.[4] With 43 percent of the population in 0 – 15 age group, the Ethiopian population can be described as young, but recent trends in the fertility rate suggest the beginning of a reversal, with a slight shift from a population that has been "younging" to that with early signs of a trend toward aging.[5] The total fertility rate, the average number of children per woman over the course of her lifetime, has shown a reduction from 5.5 children per woman in 2000 to 4.6 children per woman in 2016.[6]

Figure 1.2:Population Pyramid of Ethiopia:2016
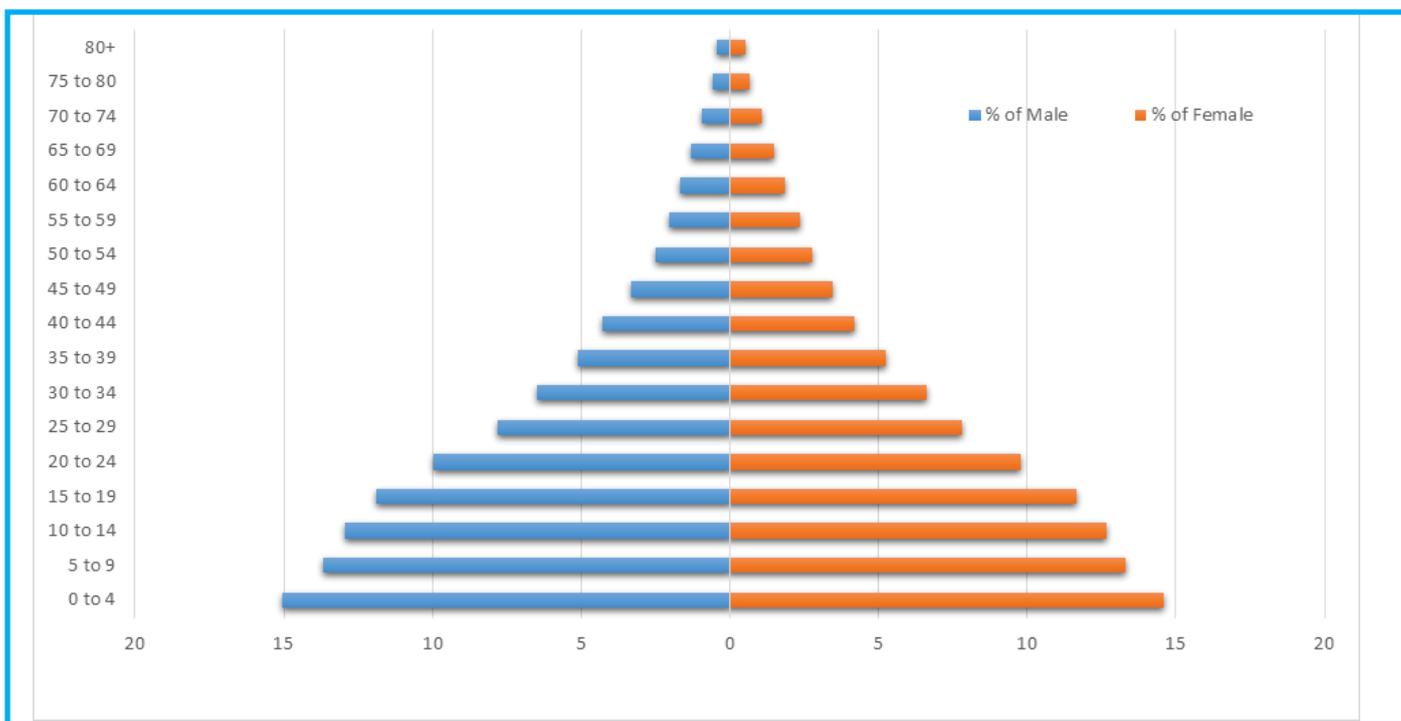
Source: Constructed based on the data extracted from World Development Indicators (WDI) data catalogue (updated in 2018)

The Ethiopian population has traditionally been highly concentrated in the highlands. About 77 percent of the population lives at an altitude of over 1800 meters above sea level. [7] As a result, 80 percent of the country's population inhabits only on 37 percent of the total land area, mostly in the highlands.[8]

Economic Trends

In the twelve years between 2004/05 to 2016/17, Ethiopia registered relatively high economic growth, with annual average real GDP growth rate of 10.8 percent since 2004/05, one of the fastest in the world.[9] This growth was driven mainly by the public sector-led development strategy, with its focus on heavy investment in infrastructure as well as sustained progress in the agricultural and service sectors. The investment in the public sector include expansion of road networks, construction of hydroelectric power plants and transmission lines, airports, telecommunication systems, health and education facilities, and most recently railways. Growth has been generally broad-based, as all sectors grew significantly. On average, agriculture has grown by 8.0 percent, industry by 12.9 percent, and services by 12.9 percent since 2004/05. Over the past 15 years, the contribution of agriculture to the economy has fallen while the importance of the service sector has increased. The contribution of agriculture to value added fell from 56.4 percent in 2000/01 to 36.7 percent in 2015/16 while the contribution of the services

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sector increased from 36.3 to 47.3 percent during this time.[10] On the other hand, the manufacturing sector continues to contribute a small share of GDP, while the full potential of the private sector remains restricted by various business climate constraints. The Growth and Transformation Plan II (GTP II 2015-2020) sets to elevate the country to lower-middle income status by 2025.

Figure 1.3:Real GDP Growth Rate (%)
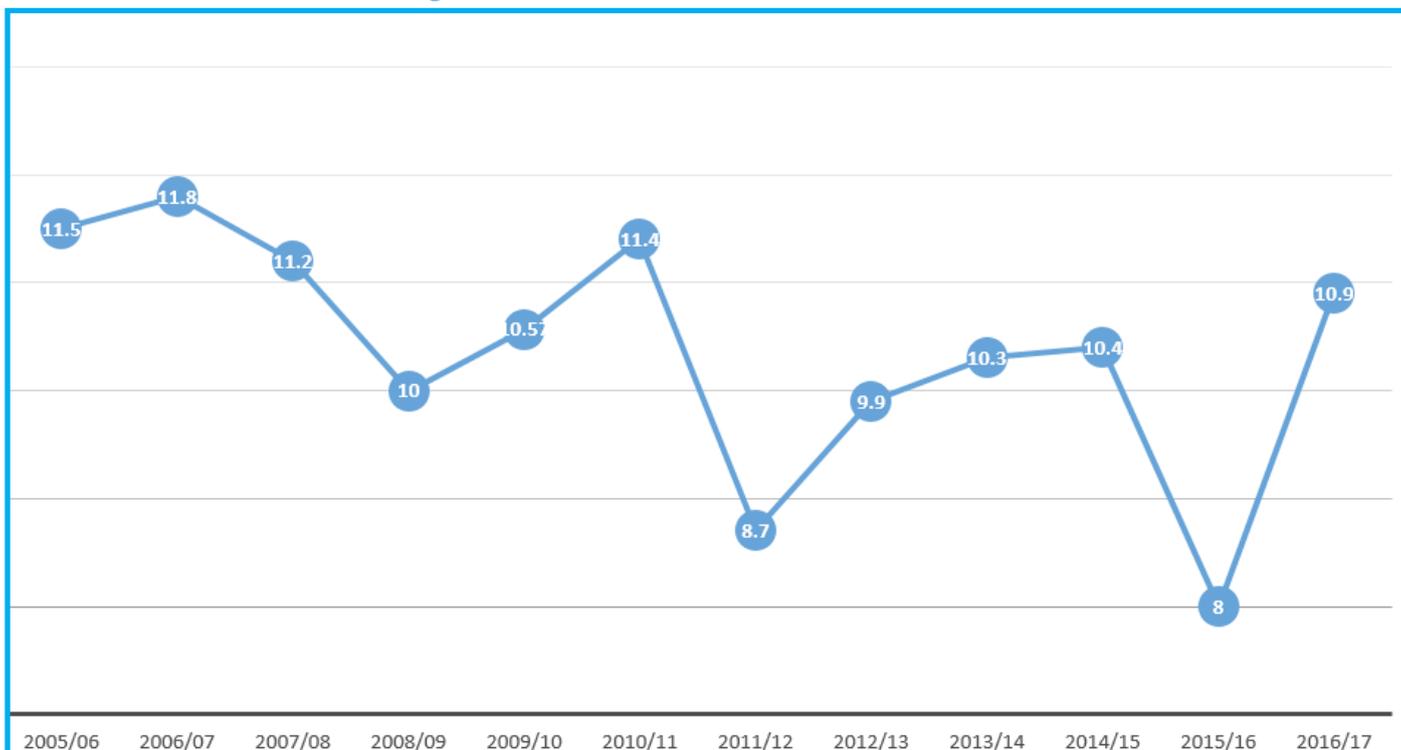
Source: National Bank of Ethiopia (NBE)

Agriculture provides employment for 72.7 percent of the country. The agriculture sector generates about 90 percent of export earnings and supplies about 70 percent of the country's raw material requirements for industries. While coffee remains the largest foreign exchange earner, Ethiopia is diversifying exports, and agricultural products such as sesame, khat, livestock and horticulture products are becoming increasingly important.[11] However, the agriculture sector is at rudimentary level, utilizing resource-demanding and archaic technologies, with heavy dependence on draft power or hoe cultivation. Nearly 96 percent of thecultivated land in the country is occupied by small scale farmers who produce 90 percent of the total agricultural output. The average land holding size of these agricultural households is estimated to be 0.95 hectares while about one third of them possess farmland less than 0.5 hectares, mainly for subsistence.

The agriculture sector in Ethiopia is predominantly rain-fed subsistence production, and is highly vulnerable to drought, environmental degradation and other hazards. Recurring drought in the country continue to put the food security status of millions of small holder farming households at stake.

The agricultural population face arrays of challenges including weak integration into markets, limited access to finance, and modern agricultural technology. To facilitate knowledge and skills transfer to smallholder farmers, the Government of Ethiopia (GOE) has deployed more than 70,000 agricultural extension agents to rural Kebeles, in both crop producing and semi-pastoral areas. Between 1993 and 2013, agricultural output increased by 160 percent, an average increase of 5.4 percent per annum.

Ethiopia's livestock population is believed to be the largest in Africa and tenth in the world. The sector accounts for about 10 percent of Ethiopia's export income, with leather and leather products making up 7.5 percent and live animals comprising 3.1 percent. The country is home to about 57.8 million heads of cattle, 29.7 million heads of goats, 28.9 million heads of sheep and 60.5 million chickens in 2015/16.[12] However, production and productivity of livestock in Ethiopia is low due to poor breeding and husbandry practices.

In the past two decades, the investment in the industry sector has been primarily in infrastructure, construction, agriculture/ horticulture, agricultural processing, textiles,

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leather and leather products. In 2016, the manufacturing sector contributed less than 8 percent of the total export of the country. The government envisages to increase the manufacturing export in the coming years due to the growing presence of international investors. The GTP II (2016-2020) aims to develop the manufacturing of textiles and garments, leather goods, and processed agricultural products.[13] The focus on these sectors is driven by the country's relative advantage compared to other sectors. In order to support the industrialization process, Ethiopia is working to increase installed power generation capacity by building major dams, including the Grand Renaissance Dam with a planned power generation capacity of 6000 MW, and expanding to other sources of renewable energy.

Poverty and Food Security Contexts

In 2000, Ethiopia had one of the highest poverty rates in the world, with 55.3 percent of the population living below the international poverty line of US$1.90 PPP per day and 44.2 percent of its population below the national poverty line. By 2011, 33.5 percent lived on less than the international poverty line and 29.6 percent of the population was counted as poor by national measures.[14] In 2016, the percentage of population below the national poverty line fell to 23.5 percent.[15] Although Ethiopia still faces high levels of food insecurity, ranking as one of the hungriest countries in the world, the Global Hunger Index (GHI) score has declined from 55.9 (extremely alarming) in 2000 to 29.1 (serious) in 2018.[16]

Droughts and other related disasters (such as crop failure, water shortage, and livestock disease, land degradation, limited household assets, low income) are significant triggers that increase vulnerability to food insecurity and undermined livelihoods.[17] Climate related shocks affect productivity, hamper economic progress, and exacerbate existing social and economic problems. The 2015 El Niño drought was one of the strongest droughts that has been recorded in Ethiopian history, resulting in more than 27 million people experiencing food insecure and 18.1 million people requiring food assistance in 2016. Crop loss as a result of the 2015/16 El Niño-induced drought was massive, reaching 50 to 90 percent in some regions. Many households lost productive assets, including livestock. While better rains during June to September 2016 brought some relief in crop dominant areas, livestock death continued in

pastoralist areas due to the Indian Ocean Dipole (IOD) related drought in late 2016.[18] Particularly, Afar, Somali and Oromia regions had been particularly hard hit by the phenomena. where water sources had dried up and pastoralists could no longer find pasture for their animals. The loss of animals, a source of milk and protein, had a negative effect on the nutritional status of children.[19]

In an effort to abate the chronic food insecurity prevalent in the country, the GoE launched the second largest rural social protection programme in Africa, next to that of South Africa, known as the Productive Safety Net (PSNP), in 2005. The PSNP provides cash or food to people who have predictable food needs in a way that enables them to improve their own livelihoods and therefore become more resilient to the effects of shocks in the future. Most beneficiary households participate in public works as part of their eligibility. Criteria for selection into the PSNP are that a household is poor (for example, it has low holdings of land and/or cattle) and food insecure, but also has able-bodied labor power. A much smaller proportion of beneficiaries receive direct support: these households are poorer than those receiving public works employment and lack labor power. Households whose primary income earners are elderly or disabled qualify for direct support. The PSNP is under implementation in Afar, Amhara, Dire Dawa, Harari, Oromia, SNNPR, Somali and Tigray Regions. Multiple evaluations have shown that the programme reduces household food insecurity and distress sales of assets, while in-creasing household expenditures and uptake of agricultural inputs.[20] The transfers made by PSNP are reported to have made poverty reduction by two percent.[21] The fourth phase of the rural PSNP (PSNP IV 2015-2020) has targeted around 8 million beneficiaries at the cost of 3 Billion USD, funded by the GoE (14 percent) and nine donors. The PSNP IV has increased emphasis on gender equity, in part to increase the impact on nutrition.

The GoE also launched Agricultural Growth Project I (AGP I) 2010/2011 to 2015/2016, with the objectives of increasing agricultural productivity and market access for key crop and livestock products in targeted woredas with increased participation of women and youth. AGP-I emphasized agricultural intensification, growth, and the transformation from subsistence to commercial agriculture.[22] The Second Agricul-tural Growth Program (AGP II), which is aligned to GTP II, is under implementation in 157 woredas selected from 7 regional states and one city ad-

ministration of the country which have the highest growth potential, primarily based on agro-ecological conditions and access to markets.

Organization of the Report

This report is organized into ten chapters. Chapter One presents the rationale for this report and the country context Chapter two methodology including data source and measures. Chapter three presents food availability and market dynamics in Ethiopia. Chapter four analyses the state of food security in the Ethiopia as measured by a range of indicators including: food energy consumption, food consumption basket, food consumption score, dietary diversity, food access and source, and Consolidated Approach for Reporting on Food Security Indicators (CARI). Chapter five presents the profile of the food insecure households. Chapter six describes the economic vulnerability of households using: poverty, wealth index, total household expenditure, and percentage of household expenditure on food. Chapter seven presents nutritional status of under-five children and adult women. Chapter eight presents the shocks experienced by households and coping strategies employed. Chapter nine analyses the seasonality of food insecurity. Finally, chapter ten concludes with a summary of findings and recommendations.

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Methodology

The Food Security and Nutrition Conceptual Framework

The Food Security and Nutrition Conceptual Framework was used to provide the theoretical underpinning for this study. As the internationally accepted definition of food security highlight, food security is multi-dimensional, and it is not possible to measure food security with one or two indicators. All key dimensions that affect food security need to be examined. The following framework (Figure 2.1), developed by WFP, using similar frameworks by other agencies such as UNICEF's nutrition framework, thelivelihood framework and others, visually depicts how various dimensions of food and nutrition security are related and can together describe a state of food security.

Figure 2.1: The Food Security and Nutrition Conceptual Framework
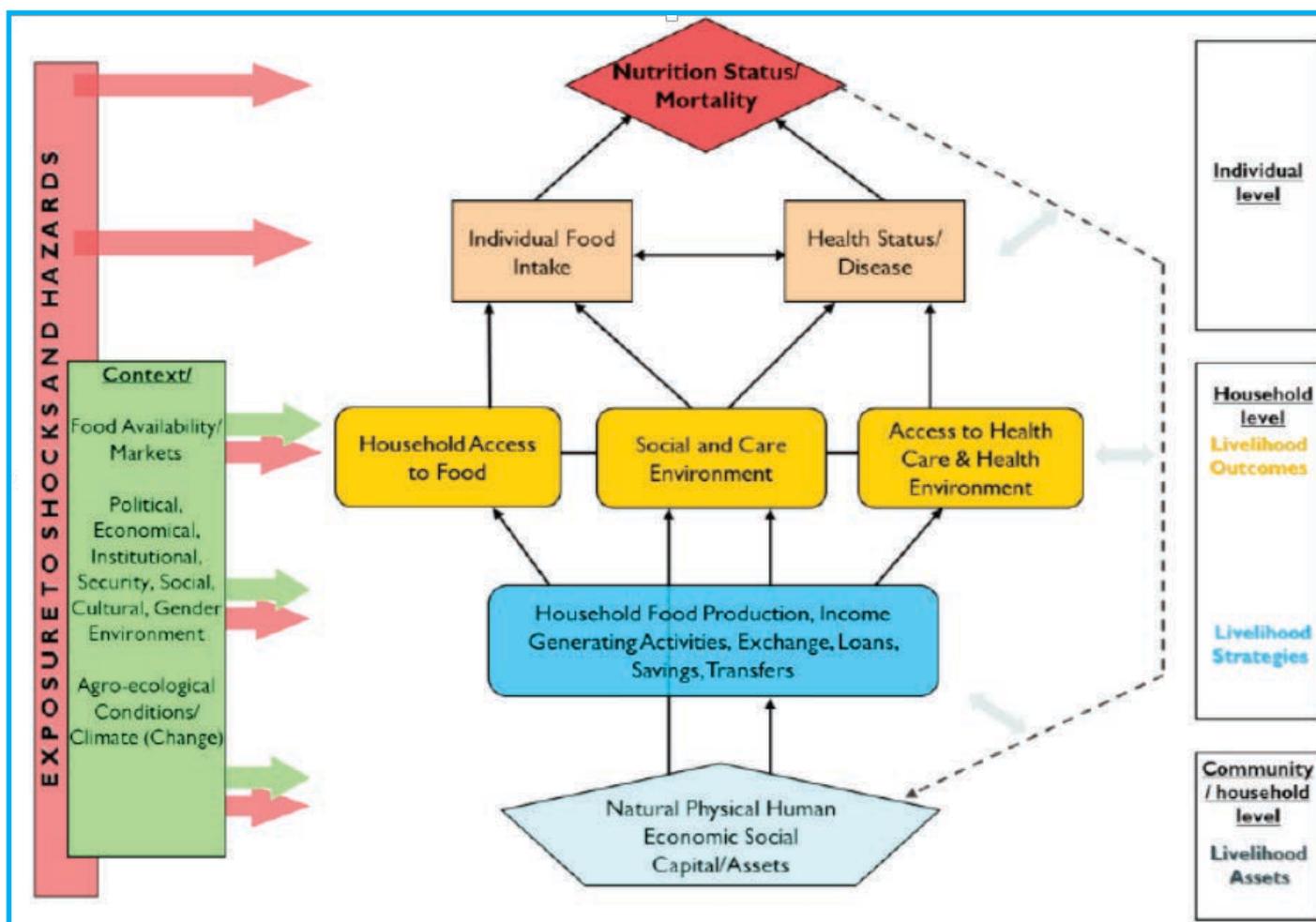
Data and Methods

This report uses multiple nationally representative secondary data sources (surveys) carried out by the GoE and partners over the last two decades.

Household Consumption Expenditure Survey (HCES) and the Welfare Monitoring Survey (WMS)

The core of the analysis in this report is based on the 2016 Household Expenditure and Consumption Survey (HCES) and the Welfare Monitoring Survey (WMS) conducted by Central Statistical Agency of the Government of Ethiopia. The initial HCES and WMS were conducted in 1995/1996 and have been conducted every five years. The 2016 HCES and WMS are the fifth round. Unlike previous rounds, the 2016 WMS and HCES data collection took place simultaneously over one-year period between 8 July 2015 to 7 July 2016 to avoid any inconsistency in data of the two surveys. The data collection for HCE survey was distributed across all months of the survey year, which helped to capture the seasonal variations of consumption by households. As presented in Table 2.1,

the total number of households sampled in the 2016 HCES and WMS was 30,240. Finally, WMS 2016 covered a total of 30,237 households while the HCES covered 30,229 households.

Table 2.1: Regional distribution of households sampled by the 2016 WMS and HCES

Region	Rural	Urban	Total
Tigray	1152	1152	2304
Afar	576	768	1344
Amhara	2016	3360	5376
Oromia	2304	4128	6432
Somali	576	1152	1728
Benishangul-Gumuz	576	768	1344
SNNPR	2016	3168	5184
Gambella	576	768	1344
Harari	288	384	672
Addis Ababa	0	3840	3840
Dire Dawa	288	384	672
National	10368	19872	30240

A stratified random sampling technique was employed to draw a representative sample. The country was first stratified into nine regional states and two city administrations. Each stratum was further stratified into three broad categories namely, Rural, Major Urban centres and Other Urban areas. Harari Region and Dire Dawa City Administration were stratified into rural and urban categories, while Addis Ababa has only urban category, but stratified by sub-city. Therefore, each category of a specific region, in most cases, was a survey domain or reporting level for which the major findings of the survey are reported.

The HCES collects data on consumption and expenditure and is used by the government to measure income poverty. The HCES 2016 contains an extensive consumption expenditure module consisting of about 740 food items and records household food consumption over the past seven days before the survey. The WMS 2016 collected a range of data on education, health, child care and breast feeding, access to and utilization of basic facilities, housing and housing amenities (drinking water, sanitation, energy, etc.), household assets, access, utilization, and satisfaction of basic facilities, selected

indicators of living standard, harmful traditional practices and basic population characteristics.

WFP food security and vulnerability modules were incorporated into the WMS 2016 instruments to compliment the data already collected. These additional sections included:
• 7-day food consumption frequency and sources
• Shocks and coping strategies

The 2016 HCES and WMS datasets were merged to conduct the data analysis for this report. Descriptive statistics including means, medians, percentages are presented by groups, usually in national/total, regional, expenditure quintiles, and urban/rural categories. The results are presented in tables, graphs, and maps. Sampling weights provided by CSA, which are based on selection probabilities, were applied to compute representative estimates for these broad categories in the country.

To examine the correlates of food insecurity in Ethiopia, we estimated logistic regression model. The dependent variables are a zero/one dummy variable identifying households that were food insecure as measured by food poverty, FEC, FCS, and CARI. Sampling weights were not applied for the regression analysis.

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The hotspot analysis of food insecurity indicators (food poverty, FCS, and CARI) were computed considering individual households covered during the 2016 HCES/WMS. The analysis depicts clustering of these households in relation to the parameters considered and the weight applied for each household. The hotspot analysis helps to identify the locations of statistically significant clusters with high densities of food insecurity according to 2016 HCES/WMS. In order to conduct trend analysis for different indicators, the data from the previous rounds of WMS and HCES (1995/96, 1999/2000, 2004/05, 2010/11) were also analyzed and included in this report.

Ethiopian Demographic and Health Survey (EDHS)

Anthropometric data collected in Ethiopian Demographic and Health Survey (EDHS) was used to analyze the levels of child malnutrition (stunting, wasting, underweight among under-five children) and adult malnutrition (BMI<18.5) and associated socio-economic and demographic factors. Previous rounds of EDHS data were also referred for trend analysis of the nutrition indicators in this report. For descriptive statistics calculations, the data was weighted according to DHS guidelines.[23]

Other Secondary Sources

Secondary data reviewed and utilized in this report include time-series wholesale and retail price data of different grains collected by ETBC, WFP Ethiopia grain price data, consumer price index (CPI) data, and Agricultural Sample surveys of CSA. Descriptive statistics were run to assess socio-economic and demographic characteristics and investigate the relationships with outcome variables. Trend analysis was performed for key indicators to extract underlying patterns in the time series data.

Measures

This CFSVA report employed the following approaches to measure the outcome variables, food security and nutritional status.

• **Quantity of food that household members consume:** Food energy consumption per capita is calculated by dividing each household's average daily consumption by the number of household members. Average daily calorie consumption below the threshold required for a healthy active life is a strong indicator of food insecurity. If the

consumption of an individual or household falls significantly short of meeting prescribed physiological dietary energy requirements, then this indicates a state of 'hunger'. To provide the most accurate estimates of dietary deprivation, this report uses adult equivalent scales that consider age and sex specific recommended daily allowances.

• **Quality/diversity of food that household members consume:** In this report, dietary diversity has been captured by two complementary measures: i) The per capita/ per adult equivalent consumption and the share of calories obtained from different food items/ groups such as starchy staples, animal products, fruits and vegetables are presented and analysed; ii) the number of food groups (out of seven) that a household consumes over a reference period of seven days. If the diet of a household or individual is not sufficiently diverse then this will lead to poor nutritional status and ultimately ill health.

• **Adequacy of food consumption:** Food consumption score (FCS) is a composite score based on the dietary diversity, food frequency, and relative nutritional importance of the various food groups consumed. The higher the FCS, the higher is the dietary diversity and frequency. High food consumption increases the possibility that a household achieves nutrient adequacy. The FCS can be considered as a proxy of food access and food security and in that, it measures dietary adequacy. The data for food consumption is collected by asking a household member a food items consumed in the seven days prior to the date of interview. Weights are attached to each food groups based on the relative nutritional value of the food. Cereals and tubers are given a weight of 2, pulses a weight of 3, vegetables and fruit both a weight of 1, meat and fish a weight of 4, milk a weight of 4, and sugar and oil each a weight of 0.5. Food groups, such as meat (meat, fish, egg) and dairy products, that have highest quality protein (as measured by protein efficiency ratio) and micronutrients are given high weight. The observed frequency of households' consumption of various food items over a seven-day recall period multiplied by its weight to get a household's FCS. The FCS uses standardized and calibrated thresholds that divide households into three groups: poor food consumption, borderline food consumption and acceptable food consumption.

• **Food Poverty:** This is an alternative measure of adequacy of food consumption. The food poor

are those who spend less on food than is rquired to consume the minimum level of calories for a healthy active life (based on the types of foods purchased or produced and consumed by the poor, calculated at local costs). Prices are based on local market prices. This measure provides a more robust picture of food insecurity in urban areas compared to other measures as it seprates the population who may consume a diet below recommended levels from those who cannot afford to consume adequate calories.

• **Consolidated Approach for Reporting on Food Security Indicators (CARI):** is an index developed by WFP, which combines different food security indicators into one for classification of households into different food security status. For this study; food energy shortfall, poverty status and livelihood coping strategy indictors are used for classification of households into different food security status categories. Food energy shortfalls (food quantity) is generated from the actual quantity of food consumed. In CARI, households are categorized into four groups: with a per capita daily kcal intake greater than 2100 calories, with daily kcal intake less than 2100 calories but greater than mean of the Minimum Dietary Energy Requirement (MDER) and 2100 calories, and less than MDER, Households with a per capita daily kcal intake which is greater than the national MDER but less than the mean of the MDER and 2,100, Households with a per capita daily kilocalorie intake which is less than the national MDER. Poverty status: In CARI Index, households are categorized into three groups, Households with total per adult equivalent expenditure greater than the national poverty line, Households with a per adult equivalent expenditure greater than the per adult national food poverty line but less than the national

poverty line. And Households with a per adult equivalent expenditure which is less than the national per adult food poverty line.   Livelihood coping strategies: In CARI, households are categorized into four groups, No coping, stress, crisis and emergency coping strategies. These are coping capacity inductors that classify households into food secure, marginally food secure, moderately food insecure and severely food insecure households combined with the current and vulnerability status indictors. In addition to providing the population's distribution across the four food security classification groups, the CARI console also generates an answer to the question: what percentage of the population are food insecure? and indicates the prevalence of food insecurity.

• **Nutritional Status of Children and Adults:** to measure the nutritional status of under-five children three indexes have been applied.

1) Stunting or low height-for-age which is defined as having a height at least two standard deviations below the median height   for a given age as compared to an international reference population. Stunting   can be regarded as evidence of chronic malnutrition.

2) Wasting is based on standardized weight-for-height and is a measure of acute malnutrition.

3) Underweight or low weight-for-age is similarly defined and is a composite indicator of both chronic and acute malnutrition. To determine the level of adult malnutrition among women their Body Mass Index (BMI) is compared against standard cut-off points

SAVING LIVES CHANGING LIVES

3

Food Availability and Markets Dynamics

WFP World Food Programme

Food Production and Availability

Food availability refers to the physical presence of food in an area or in a country from domestic production, imports and stocks.   There are two crop production seasons in Ethiopia. The main season, which accounting for nearly 90 percent of annual crop producing, depends on the June to September rains. Crops are harvested from September to February. The smaller rains, between February to May, are very important for pastoral areas, as well as other areas of the country where long cycle Meher maize and sorghum are planted. Surplus crop producing areas are mainly located in the western and to some extent central parts of Ethiopia.

Eastern and northeastern Ethiopia, which contains both pastoralists and crop dependent areas, are food deficit areas. Pastoral areas are particularly susceptible to adverse weather conditions, which often led to livestock losses resulting in limited food and income availability for pastoral households.

Seasonal assessments and FEWS net alerts noted extensive livestock losses due to the droughts in 2015 and 2016 in pastoral areas.

Availability from production:

Approximately 32 percent of Ethiopian land is considered agricultural land.[24] Over 90 percent of crops are produced by small holder farmers, with average landholding between 0.5 to 1.2 hectares. An increasing investment in agricultural extension work and input utilization has improved crop productivity.

However, productivity remains low by international standards due to land degradation, lack of irrigation and constraints in input utilization. Currently only 5 percent of agricultural land is irrigated leaving most farmers depend on rain. A World Bank Poverty Assessment report shows that a moderate drought in Ethiopia lowers agricultural income by 15 percent.[25]

As Figure 3.2 shows, cereals production increased over a five-year period with the exception of 2015/16, an El Niño induced drought year. Annual increases compared to the previous year in the other 4 years ranged from 5.49 percent in 2017/18 to 9.75 percent in 2016/17. There was little increase in area cultivated ranging from 0.12 percent in 2017/18 compared to 2016/17 to 3 percent in 2014/15 compared to 2013/14. Expansion in areas cultivated by small holders was not expected.

Figure 3.1: Cereals-Area cultivated and Production
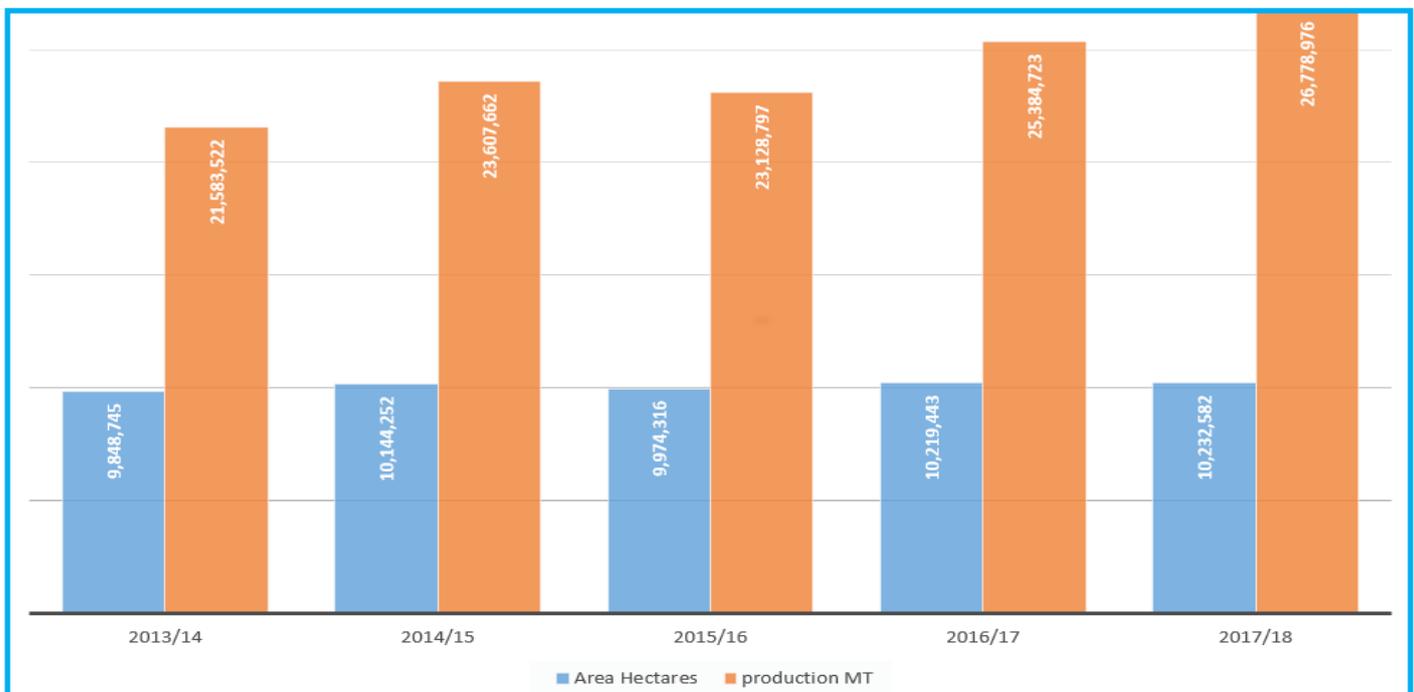
Source: Compiled from CSA Agricultural Sample Surveys

The five most common cereals, Teff, Maize, Sorghum, Wheat and Barley, account for 75 percent of the total grain area. These cereals are consumed throughout the country as staples, with varying preference by cereal type. Root crops and Enset (false banana) are also important staples, particularly in the SNNPR.

Crop	% from total grain area	% from total grain production
Teff	23.9	17.3
Maize	16.8	27.4
Sorghum	15.0	16.9
Wheat	13.4	15.2
Barley	7.5	6.7
Pulses	12.6	9.7
Oilseeds	6.7	2.8
Others	4.2	4.0
Total Grain	**100.0**	**100.0**

Source: Compiled from CSA (2017/18). Agricultural Sample Survey Report

Crop utilization and marketable surplus

The majority of cereals and pulses are produced for household consumption, with less than 30 percent sold, except for oilseeds.

Table 3.2: Crop utilization pattern of Crop producing households

	Household consumption	Seed	Sale	Wages in kind	Animal feed	Others	Total
Cereals	66.8	12.1	16.9	1.0	0.7	2.6	100.0
Pulses	57.7	13.7	26.0	0.6	0.1	1.9	100.0
Oilseeds	33.3	11.3	52.9	1.0	0.1	1.5	100.0
Vegetables	74.0	1.0	23.0	0.4	0.1	1.6	100.0
Root crops	70.3	8.0	19.6	0.3	0.8	1.0	100.0
Enset	80.0	0.5	13.6	1.2	2.7	2.0	100.0

Source: Central Statistical Agency, 2015/16 Agricultural Sample survey, Crop and Livestock Product utilization survey

Applying an average 15 percent of post-harvest losses refereed from previous studies (such as FAO/WFP CFSAM 2012, WFP Cereal Availability Study 2017), and reducing seed and animal feed and other uses at 12 percent and 3.25 percent respectively, a total of 19,290,905 MT cereals can be assumed to be available for consumption (own consumption and the food sold is assumed to be

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for consumption). Dividing this to the CSA population figure of 94.3 million in 2017/18, on average 204 kg of cereal is available per capita per year for consumption.

Similar calculation for pulses reveals 24 kg of pulses per person per year is available for consumption purposes. Taking an average 3,000 calories per kg of cereal and 3,400 calories per kg of pulse, the per capita cereal and pulses available for consumption will meet 90.5 percent of calorie needs based on 2,100 minimum calories per person per day. When other sources of calories, such as root crops, Enset (falls banana), or animal protein are added, availability at national level does not seem to be a big problem. In some years, Belg season performs adequately to provide additional number of crops, the last data available for 2014/15 Belg production shows cereal and pulses made up 7 percent of annual cereal and pulse production.

Cereals continue to be imported however.. Specifically, wheat is imported commercial purposes as well as , market stabilization and food assistance while sorghum is occasionally imported for food assistance. In addition, national averages disguise geographic differences in food availability. In pastoral and food deficit crop areas, households are net buyers.

Food Imports and Exports

Despite the country's large production of different varieties of grain, imports continue ether commercially or as part of food assistance programs. Wheat makes up the largest share of grain import whereby, the government has on average imported about 600,000 MT of wheat per year over the past five years (Fig 3.2).. Imports by ETBC are mainly for market stabilization. An additional 600,000 MT of food per year was imported on average for relief and PSNP assistance programs. It should be noted 2015/16 was an exceptional drought year.

Table: 3.3: Humanitarian Food Assistance, Ethiopia, MT

Year	2012	2013	2014	2015	2016
MT	412,487	260,773	238,238	711,392	1,398,890

Source: Compiled from WFP records

Figure 3.2: Quantity of Wheat import by year (MT)

Source: ETBC

Grains are not major export items in Ethiopia. Nonetheless different cereals and pulses are traded externally either through formal or informal means. Reports from the CSA using customs data show that formal cereal export amounts vary from year to year. Available record show, cereal exports stood at 51864 tones in 2014, 15970 tons in 2015 and only 5485 tons in 2016 according to the CSA using customs' data. The same source shows cereal imports amounted to 1,398,823 tons in 2014, 1,701,481 tons in 2015 and a total of 2,825,129 tons in 2016. The government uses export bans as one of the measures to stabilize food prices, lifting bans to gain foreign exchange, particularly if production is deemed good. At the same time, there are informal trades where different cereals and pulses are traded across the border. According to the Food Security Nutrition Working Group (FSNWG) East African cross border trade bulletin, in the first quarter of 2018, about 1,869 MT of maize, 704 MT of sorghum and 9,545 MT of beans was traded informally from Ethiopia to neighboring counties. All in all the country is a net importer of cereals comparing the above figures of imports and exports.

Grain Food Market Environment in Ethiopia

Policies Affecting Market Functionality

In early 1990s, the Ethiopian Grain Trade Enterprise (EGTE) was set-up with the mandate to: stabilize prices by encouraging production and protecting consumers from price shocks; maintaining a strategic reserve for disaster and emergency response; and earning foreign exchange through grain exports. During this time, private sector trading was allowed, and traders competed with the EGTE, which made the price

stabilization effort of the enterprise difficult. Following the drastic rise in the prices of major cereals starting 2005-2008, the government identified price stabilization and maintaining a strategic national reserve as priorities to ensure food security. Again, in order to ameliorate the consequences of price surge in food commodities in 2008-2009, the government imposed a ban on grain exports. Direct government import of wheat was also started for sale, which the Ethiopian Trading Business Corporation (ETBC) then sold to selected commercial millers to provide subsidized bread to consumers. Ethiopian Commodity Exchange (ECX), which was launched in 2008, was designed to handle staple grains and to play a key role in aggregation, market information and help smooth the functioning of commodity trading.

However, it shifted its focus to coffee, sesame and pulses after it failed to attract large volumes of grains. Another actor in the grain market is the Ethiopian Emergency Food Security Reserve Administration (EFSRA), which imports, as well as buys and holds grain stocks locally. It plays an active role in price stabilization through its grain reserve mandate to buy from farmers when prices fall. EFSRA maintains stock for emergency operations of the government and food aid agencies, such as WFP, which may borrow for their interventions and replenish after receiving their stock.[26]

Market Accessibility

Distance from markets and services is an important determinant of food security and poverty. According to Ethiopian Road Authority (ERA), 40.5 percent of areas in the country are further than 5 km from all-weather roads, which puts the average distance to all-weather roads is 6 km.[27] Some 70 percent of the rural population in Ethiopia must travel about six hours to reach all weather roads. To make things worse, most of these roads are dry weather roads.[28] Most Ethiopians still rely on pack animals and carrying loads on their own heads and backs to get goods to market, which limits the mobility of rural people. Only 28.8 percent of the rural population are within 2 km of a market.[29] The analysis conducted by World Bank suggested that poverty rates increase by 7 percent with every 10 kilometers from a market town.[30] Thus, the Ethiopian agricultural output markets are generally characterized by an inadequate transportation network and accessibility is an issue of great concern particularly for a great majority of the rural population.

Figure 3.3: Major Market Location in Ethiopia
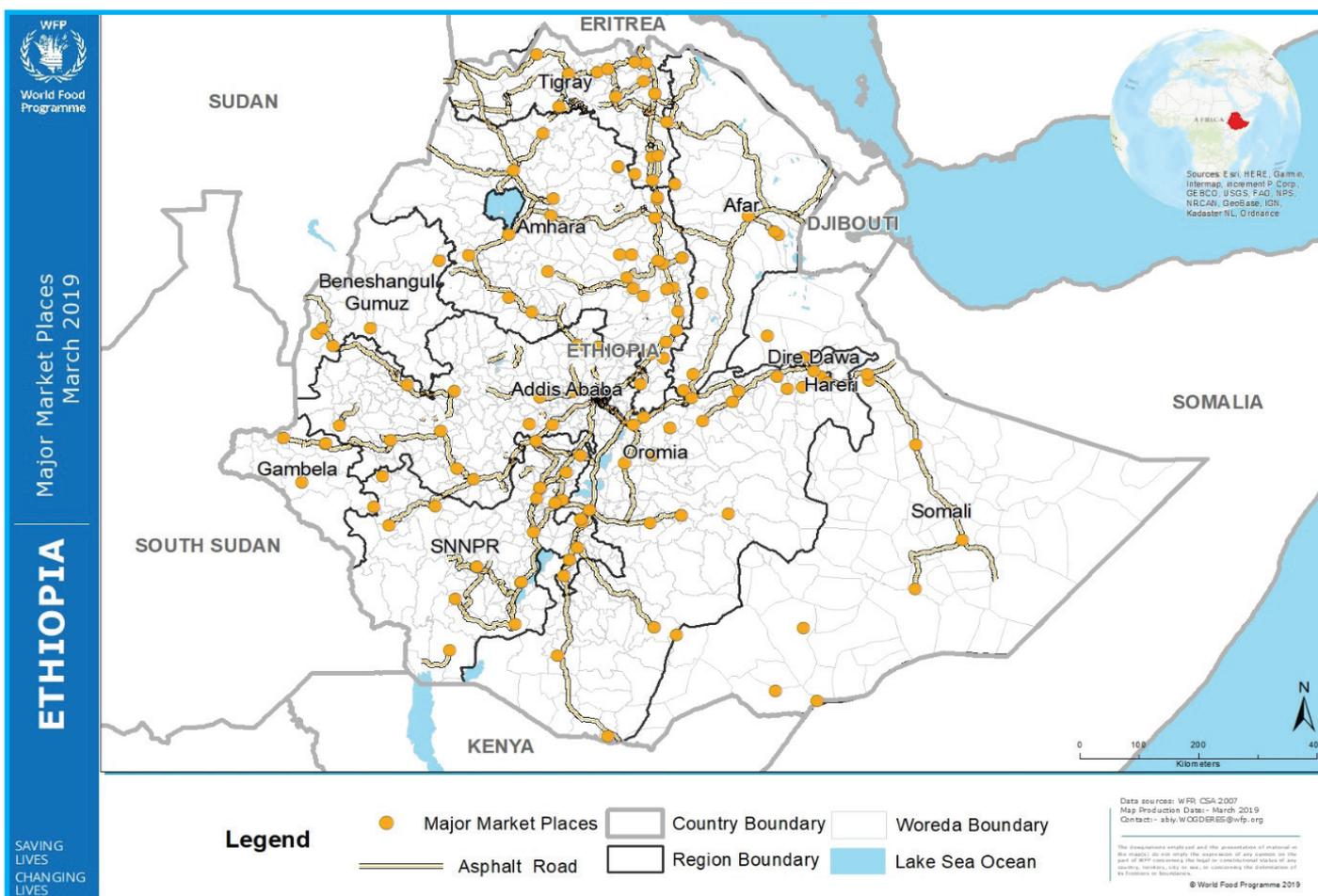
Grain Market Structure and Performance

Major food crops are produced in almost all regions of the country despite the variation in volume and type across geographic areas, which may be attributed to the extent of area devoted to each crop type, weather change and a shift in preference for the crops grown. Millions of farmers and consumers, as well as several marketing agents, are engaged in the production and consumption of grain and in the provision of diverse marketing services, namely, buying, selling, transporting, storing, processing and retailing. The main grain market actors in Ethiopia consist of smallholder producers, assemblers, inter-regional traders, ETBC (Government owned), private wholesalers, processors, retailers and consumers. Producers' market outlets include:

(a) direct sales to rural and urban consumers
(b) direct sales to rural assemblers/farmer traders,
(c) sales to retailers,
(d) direct sales to inter-regional traders,
(e) direct sales to Government and
(f) direct sales to privately owned large mills.

Although considerable differences exist in inter-and intra-regional grain flow, Figure 3.4 depicting the grain marketing channel in the SNNPR provides an overview of the grain marketing channels and major actors in the market structure. Smallholder grain producers tend to sell grain to assemblers, local traders and primary cooperatives, as well as directly to consumers. Wholesale traders sell directly to regional traders, other wholesalers, retailers, and in some instances directly to consumers. Regional traders sell to millers and processors, ECX, and exporters. They also sell to retailers and wholesalers. Cooperative Unions generally buy from primary cooperatives and sell to grain processors (millers), food assistance agencies like WFP, regional traders and ECX. The ETBC sells subsidized wheat to large millers, and maize and sorghum to food aid agencies. Finally, millers sell the subsidized flour to urban wholesalers and retailers, bakeries, and factories, at a fixed price.

Competition is high among retailers, collectors and traders in the maize and wheat value chains. There are many retailers competing in terms of price, quality, customer handling.[31] According to a study commissioned by USAID, there are low levels of market concentration with no single trader or group of traders sell or buy such a large share of grain at the woreda or local markets.[32] The study also noted that the way the grain price is determined is through negotiation between the grain seller and buyer, another indicator of the normal function and performance of market.

Figure 3.4: Grain marketing Channel of the SNNP Region
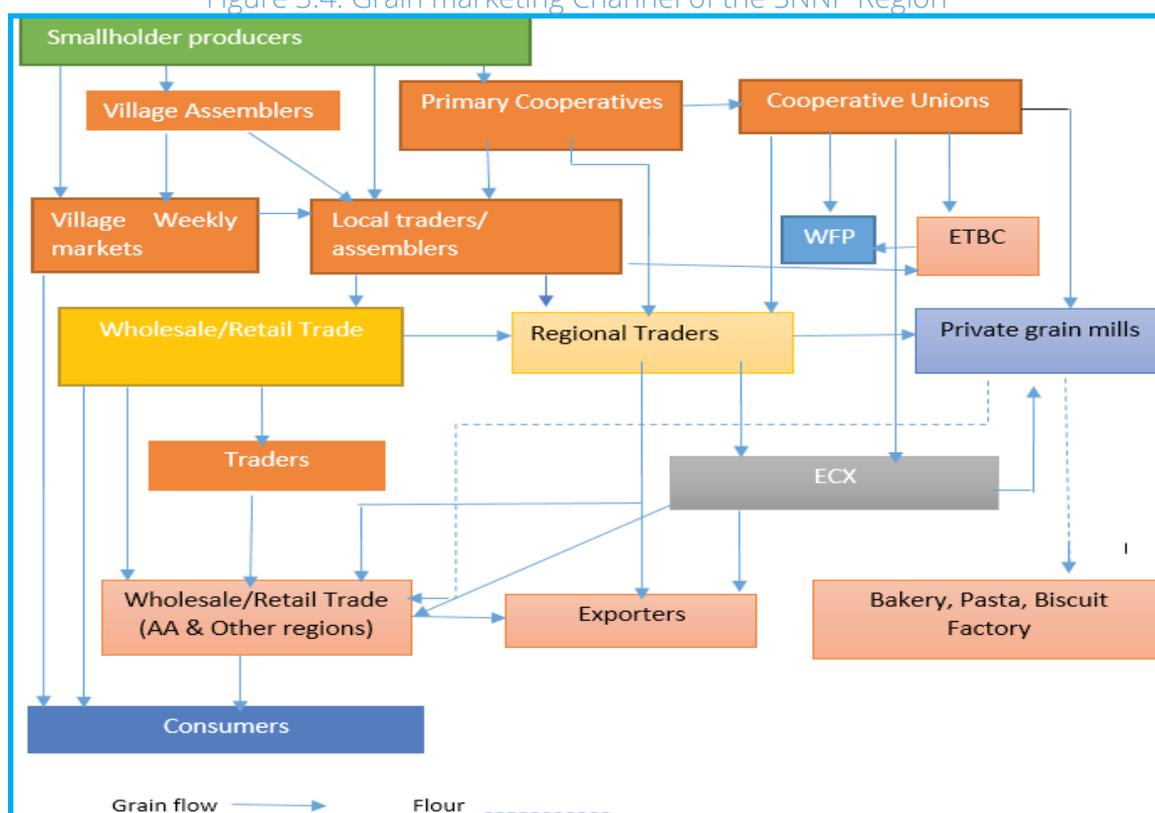
Source: Adapted from Getachew Olana et al: Bellmon Analysis Crop Availability and Market Study in Ethiopia: Analyzing Crop Production, Availability, and Markets

Consumer Price Index (CPI)/ Inflation

Poor households tend to spend a significant proportion of their income on food, as a result inflation causes harm to vulnerable households that are highly dependent on market purchases. For these households, rising food prices are likely to negatively impact their food security situation. Inflation as measured by the consumer price index (CPI) reflects the average change in the cost to the average consumer of acquiring a basket of goods and services. The CSA uses household expenditure weights of the goods and services in the basket and their current market prices to determine CPI. Figure 3.6 depicts the trends of general inflation, food inflation, cereals and bread inflation, and non-food inflation between 2011 and 2018, based on the CPI data of CSA. The general inflation rate in Ethiopia averaged at 14.3 percent from 2011 until 2018, reaching an all-time high of 40.6 percent in August 2011 and a record low of 5.4 percent in October 2014. The food inflation during the same period averaged around 15.9 percent, ranging between 51.7 percent in October 2011 to 1.6 percent in April 2013. In 2011 and 2012, the annual average inflation rates were in double digits, 33.2 percent and 24.1 percent, respectively. In 2013, the annual average inflation rate decreased to 8.1 percent. The increase in agricultural production and general economic growth observed in the country has contributed for the reduction of inflation rate further to 7.4 percent in 2014. In 2015, the annual average inflation increased by 36.6 percent as compared to the previous year average and reached 10.1 percent, mostly because of the price hike in food items. The inflation rate in 2016 and the first half of 2017 remained in single digit until it jumped once more to double digit in August 2017. In general, volatility of prices is more pronounced for food items as compared to non-food items.

Figure 3.5: Trends of year-on year inflation rate: Ethiopia (2011 -2018)
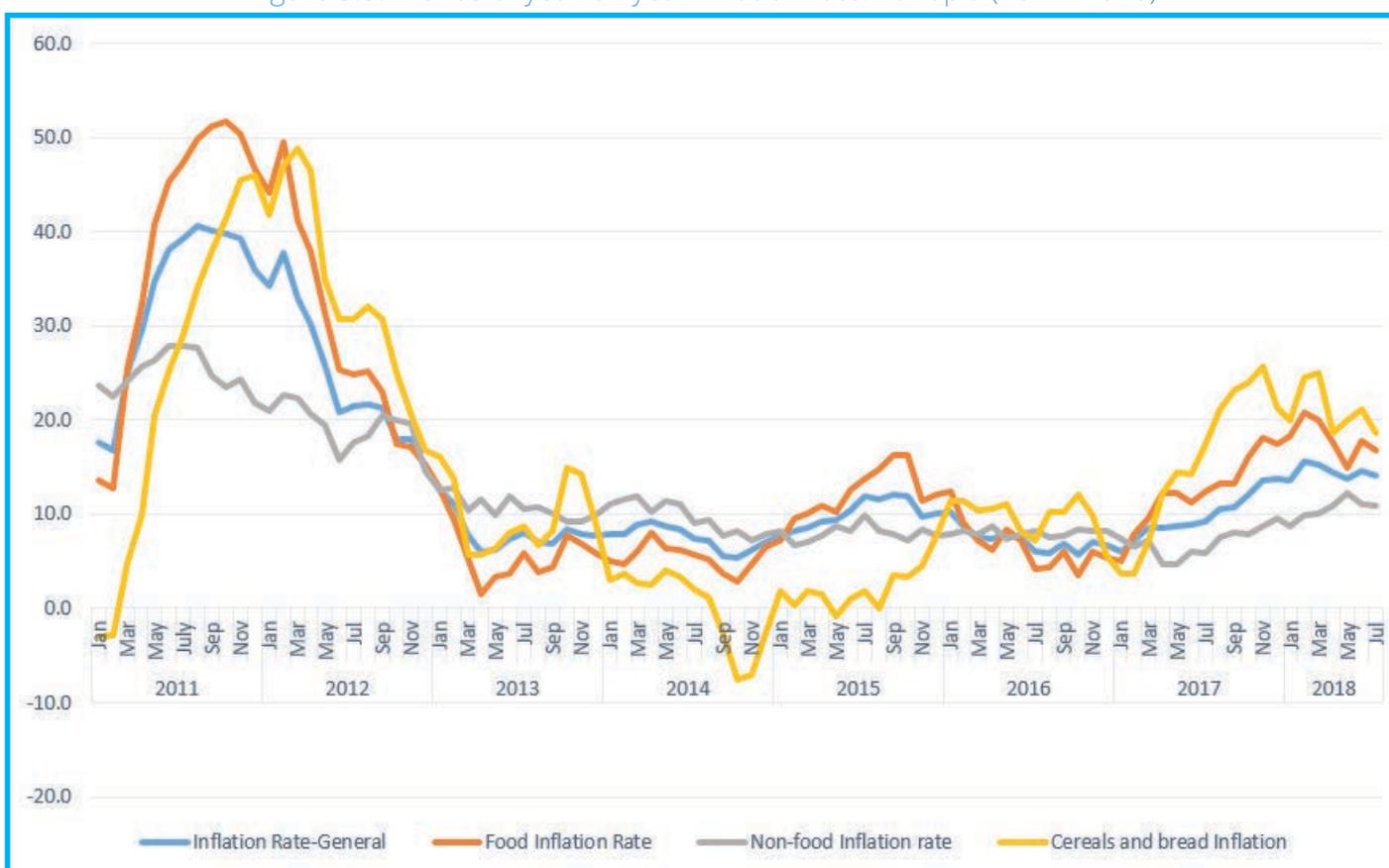
Source: Compiled from Central Statistical Agency (CSA) CPI reports

Cereals Price Trends

The trends in the nominal price of the most important cereals, namely: maize, teff, wheat, and sorghum in Addis Ababa markets are presented in Figure 3.7 for the period between 2012 to 2018. Teff grains are white, mixed (locally known as sergegna) or red, with the white fetching the highest and red the lowest price. The nominal price of teff showed a generally increasing trend since the end of 2014. From 2015 to mid-2018, the nominal price of teff elevated by 72 percent. Given sorghum may be substitute for teff in the preparation of injera in different parts of the country, the trend in the price of sorghum moved in tandem with the price of teff. The nominal price of maize showed little volatility over the period between 2012 to 2017 until it dramatically

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increased 118 percent in August 2017 as compared with the five years average. This unprecedented price increase was due to the export of maize to Kenya following the export ban measure taken by Tanzania. Despite significant increases registered in 2017 in the price of maize, it was still the cheapest cereal available, making it an often-used substitute for other more expensive grains.

Figure 3.6: Normal wholesale Price of Maize, Teff, and Wheat in Addis Ababa Markets (2012-2018)
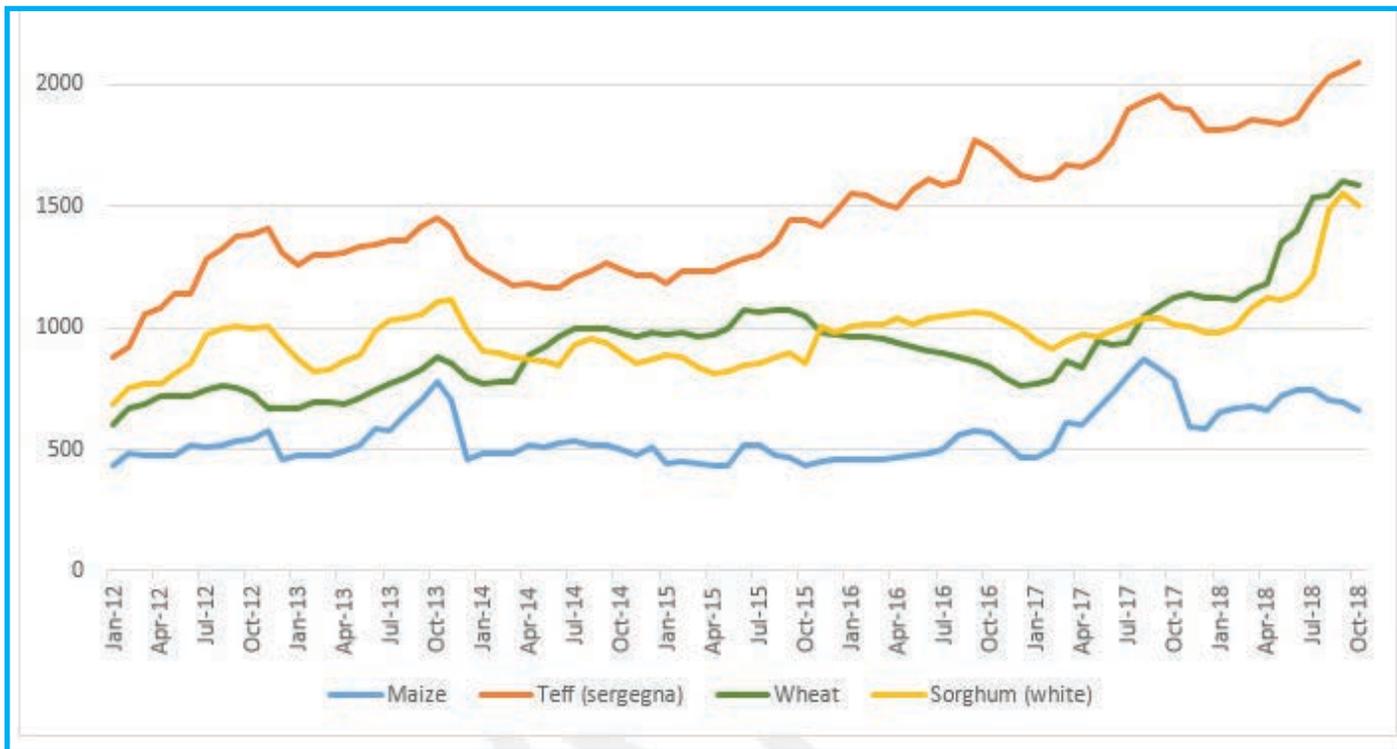
Source: Compiled from EGTE / ETBC price database

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[23]According to the DHS guideline, the variable V005 in the dataset should be divided by 1,000,000 to create weight for analysis.

[24] http://ethiopia.countrystat.org/home/en/

[25] World Bank (2015). Ethiopia: Poverty Assessment

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[31]World Bank (2018). CEREAL MARKET PERFORMANCE IN ETHIOPIA: Policy Implications for Improving Investments in Maize and Wheat Value Chains. Agriculture Global Practice GFA13

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4

The State of Food Security in Ethiopia

This section focuses on an overview of food consumption and food security situation by region, an area of residence (urban and rural), and wealth group based on a number of outcome indicators measuring: diet quantity, diet quality, diet adequacy, and food access by source. In this report, a Consolidated Approach for Reporting on Food Security Indicator (CARI) is used for classifying households into food secure and food insecure.

Food Energy Consumption (FEC)

The total energy content of the food consumed by households was calculated by multiplying the quantities of the edible portion of different food items consumed by the households by energy conversion factors. Average daily food energy consumption per adult equivalent [33] is calculated by dividing each household's average daily caloric consumption by the number of household members, adjusting for age and sex.[34] At national level, the mean energy consumption

stands at 3,008 Kcal per adult equivalent. Figure 4.1 presents the mean and median daily calorie consumption per adult equivalent by region. SNNPR, Gambella, and Oromia have the highest average Kcal consumption per adult equivalent. The average daily energy consumption in Amhara, Tigray, Beneshangul-Gumuz, and Addis Ababa fall substantially below the national average. Urban areas have lower average energy consumption compared to their rural counterparts. This may be due to the lower calorie requirement in urban settings compared to rural residents that require higher amount of energy to undertake labour intensive agricultural activities.

Median of net daily calorie intake divides the households into two equal segments with the first half consuming less than the median daily calorie and the other half consuming more. It is considered to be a better indicator than the mean values as it is not dramatically affected by unusually high or low (outlier) values. The median daily calorie consumption per adult equivalent stood at 2,786. This means, half of the population of the country consumes calories below the median value.

Figure 4.1: Mean and median of daily calorie consumption per adult equivalent
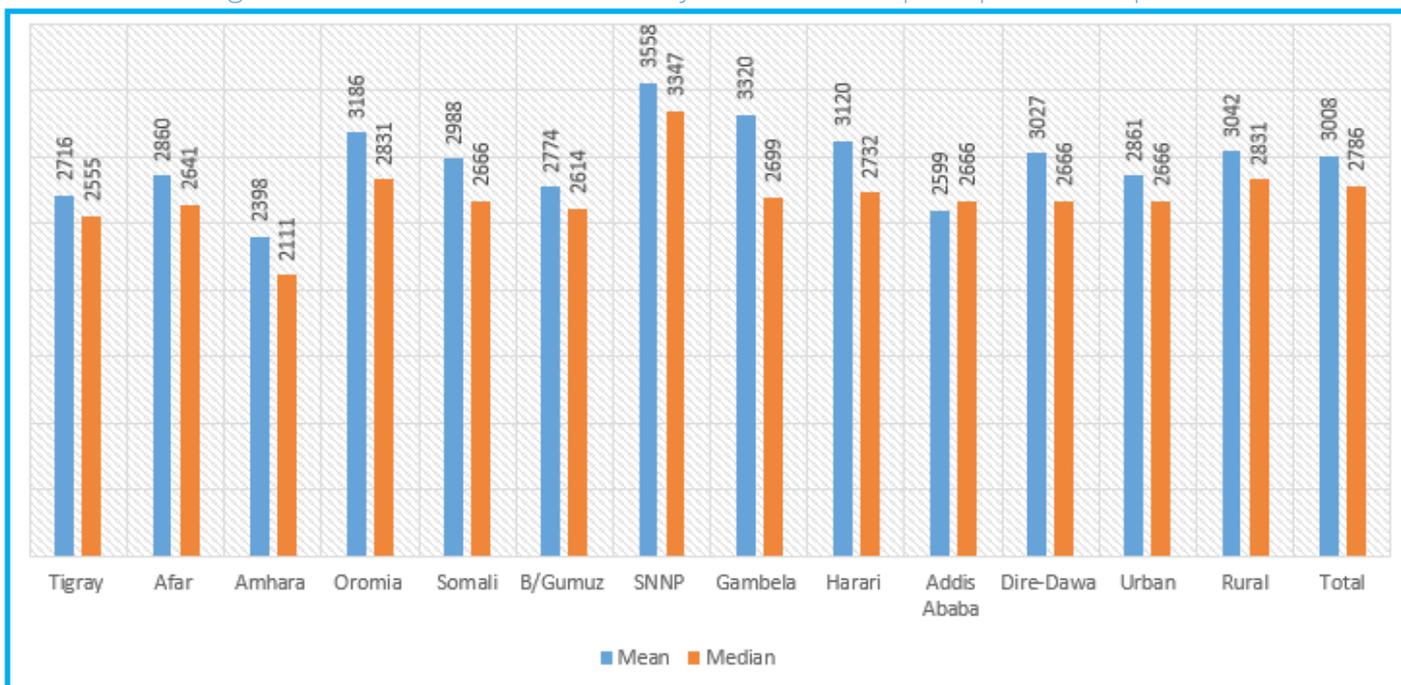
Source: Computed from 2016 HCES

Table 4.1 presents the trends of average calorie intake over the twenty years' period between 1996 to 2016. SNNPR and Gambella observed 96 percent and 84 percent increase in the average calorie intake over the two decades' period, respectively. The least performance in terms of percentage of increase in calorie intake per adult equivalent was noted in Amhara (21 percent) and Afar (28 percent) during the period under consideration. At national level, between

1995/96 and 2015/16, per adult equivalent net calorie consumption increased by 54 percent.

Between 2011 and 2016, SNNPR, Gambella, and Dire Dawa observed an increase of 8 percent in per adult equivalent calorie intake. On the other hand, the average calorie intake in Beneshangul Gumuz, Amhara, and Tigray has decreased by 10 percent, 8 percent, and 4 percent, respectively, over the same period.

Table 4.1: Average Calorie intake per adult equivalent per day, by region; 1996, 2005, 2011, 2016

Region	1996	2000	2005	2011	2016	% change (1995 to 2016)	% change (2011 to 2016)
Tigray	1,876	2,422	2,570	2823	2716	45	-4
Afar	2,240	1,892	2,492	2788	2860	28	3
Amhara	1,975	2,550	2,508	2613	2398	21	-8
Oromia	2,016	2,688	2,893	2978	3186	58	7
Somali	2,144	2,175	2,713	2863	2988	39	4
Benshangul Gumuz	1,801	2,627	2,625	3079	2774	54	-10
SNNPR	1,817	2,753	2,926	3288	3558	96	8
Gambela	1,801	2,417	-	3083	3320	84	8
Harari	2,268	2,286	2,715	3070	3120	38	2
Addis Ababa	1,993	1,917	2,239	2556	2599	30	2
Dire-Dawa	1,824	2,104	2,418	2814	3027	66	8
Total	1,953	2,606	2,746	2928	3008	54	3

Source: Compiled and computed from Poverty Reports by MOFED and Planning Commission

To further look into the pattern of energy consumption by the rich and poor, the households were classified into quintile groups based on their household expenditure and consumption. The first quintile comprises the poorest 20 percent while fifth quintile represents the richest 20 percent. As illustrated in Figure 4.2, the average daily energy consumption consistently increases as we go from the poorest quintile to the richest quintile. The fourth and the fifth quintile consume almost two-fold of the of calorie consumption of the poorest quintile. Female-headed households have higher level of daily calorie consumption as compared to their male-headed counterparts. The only quintile that does not meet the average minimum calorie requirement is the poorest quintile.

Figure 4.2: Mean and Median daily calorie consumption per adult equivalent by expenditure PAE Quintile and gender of the household head
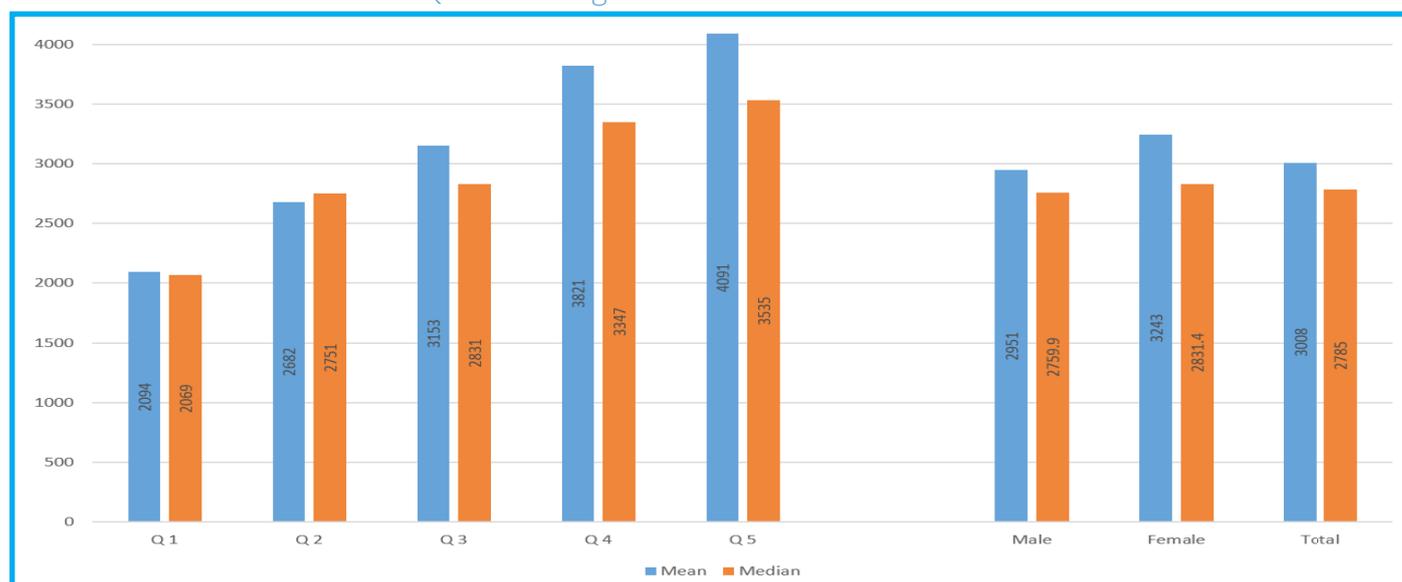
Source: Computed from 2016 HCES

The average energy consumption does not show the proportion of food energy deficient people as their values are affected by outliers, particularly at the higher end of the range. Households consuming fewer than a minimum amount of calories required for its members to stay healthy and maintain regular physical activity can be classified as food energy deficient. Households that do not consume the daily minimum requirement of 2,550 Kcal per adult equivalent are considered to be food energy deficient. As presented in Table 4.2, nationally, the proportion of households consuming less than the standard threshold (<2,550 Kcal per adult equivalent per day) constitute 31 percent of the total households in Ethiopia, 24 percent in urban and 33 percent in rural parts of the country. The highest prevalence of food energy deficiency per adult equivalent[35] is observed in Amhara region (55 percent), followed by Afar (41 percent) and Tigray (40 percent). Particularly, the prevalence of energy deficiency is highest in rural Amhara (63 percent), nearly two-fold of the national rural prevalence. In urban setting, Afar and Harari have the highest food energy deficiency among half (50 percent) of the households.

Over the five years' period between 2011 to 2016, the highest reduction of food energy deficient households was registered in Dire Dawa (34 percentage points), followed by Somali (24 percentage points), Gambella (23 percentage points), and Addis Ababa (23 percentage points). On the other hand, the proportion of food energy deficient households increased in Harari (6 percentage points), Amhara (6 percentage points), and Afar (3 percentage points) over the same period. Overall, accelerated improvements in the reduction of food deficient households was observed in urban areas (18 percentage points) as compared to rural areas (7 percentage points).

Table 4.2: Percentage of food energy deficient households (<2,550 Kcal per adult equivalent per day) and change in percentage points

Region	Urban			Rural			Total		
	2011	2016	% points change (2011-2016)	2011	2016	% points change (2011-2016)	2011	2016	% points change (2011-2016)
Tigray	37	27	-10	44	46	2	42	40	-2
Afar	39	50	11	38	38	0	38	41	3
Amhara	40	24	-16	51	63	12	49	55	6
Oromia	42	20	-22	39	24	-15	40	23	-17
Somali	41	18	-23	40	16	-24	40	16	-24
Benshangul Gumuz	30	27	-3	37	34	-3	36	32	-4
SNNPR	33	23	-10	27	12	-15	27	14	-13
Gambella	46	9	-37	30	14	-16	35	12	-23
Harari	42	50	8	15	11	-4	31	37	6
Addis Ababa	50	27	-23				50	27	-23
Dire Dawa	50	5	-45	19	15	-4	42	8	-34
Total	42	24	-18	40	33	-7	40	31	-9

Source: Compiled and computed from Poverty Reports by MOFED and Planning Commission

Food Consumption Baskets

Regional Differential of Food Consumption Basket[36]

The food consumption pattern in different parts of the country varies according to differences in agro-ecological zone, socio-economic status, and tradition, among others. Cereals are the dominant staple foods in most parts of Ethiopia. As displayed in Table 4.3, on average every adult consumes 194 kg of cereals per year. Cereals comprise the most important source of calories, constituting 60.4 percent of the total calorie in-take, out of which 84 percent is from maize, teff, sorghum and wheat. This proportion of calories derived from cereals is relatively high as compared to the average for the rest of Africa, which stands at 50 percent.[37]

The consumption of different cereals has a spatial dimension. The share of cereals for calorie intake is particularly high in Afar and Tigray. In SNNPR, the share of cereals is very low (only 45.8 percent of the calorie intake) as one-third of their calorie intake comes from root crops and tubers, which is common food items in the region. Addis Ababa also has relatively smaller share of calories obtained from cereals (54.4 percent), as significant share of calories is from oil and fats, pulses, and alcoholic beverages.

Maize is the most consumed cereal in Ethiopia. In 2016, the average annual consumption of maize stood at 66.7 kg per adult equivalent, which constitutes some 20 percent of the total calorie intake in the country. With an average 39 kg per adult equivalent per year consumption, teff is the second most important cereal in Ethiopia. It is used mainly for making Injera (pancake-like flat bread). Sorghum and wheat occupy the third and fourth position with 28.8 kg and 28.6 kg per adult equivalent per year, respectively. Nationally, processed and semi-processed cereals, like pasta, pizza, cake, biscuit consumption, average 10 kg per adult equivalent per year. Teff, sorghum, and wheat account for 12 percent, 10 percent and 9 percent of overall calories consumed, respectively.

In Tigray and Amhara, sorghum is the most important cereal followed by teff. In Oromia, the most important cereal is maize followed by teff. In the dominantly pastoral and agro-pastoral region of Somali, the consumption of wheat, maize, processed and semi-processed cereals, and sorghum constituted 19 percent, 12 percent, 12 percent, and 11 percent of the calorie intake, respectively. The consumption of processed and semi-processed cereals, such as pasta, macaroni, biscuits, cookies are common in Dire Dawa, Harari, and Addis Ababa comprising 18 percent, 14 percent, and 12 percent of their calorie intake, respectively.

Figure 4.3: Percentage Share of Cereals for calorie intake by Region
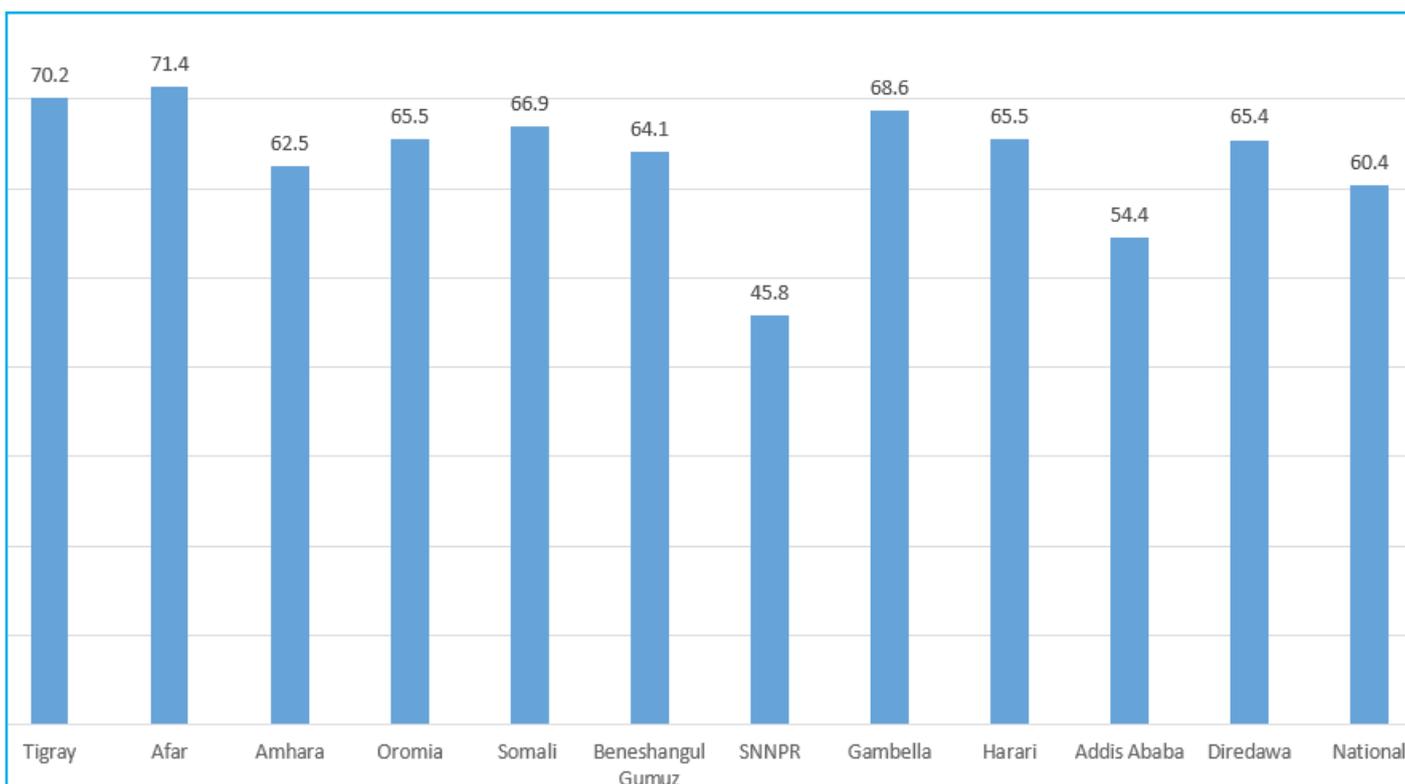
Source: Computed from HCES 2016

Pulses, which include beans, peas, chickpeas, lentils, and other pulses, are a major source of protein in Ethiopian diets. Pulses are consumed in many forms including shiro (stew), qollo (roasted), boqolt (germinated) and nifro (boiled). Nationally, an average Ethiopian adult consumes 20.1 kg of pulse per year, which constitutes around 6 percent of the total calorie intake. Beneshangul-Gumuz, Amhara, and Oromia consume relatively higher quantities of pulse per adult equivalent. The consumption of pulses is relatively low in the pastoralist and agro-pastoralist regions of Afar and Somali.

The pastoral and agro-pastoral regions of Somali and Afar have relatively higher per adult equivalent dairy products consumption as compared to other regions. Consumption of dairy products is also relatively high in Gambella. The per adult equivalent dairy intake in Amhara, Tigray, Beneshangul Gumuz, Addis Ababa, and Dire Dawa stands below the national average, 20.1 kg per adult per year. The national per capita consumption of dairy products stands at 16.6 kg, which is very low even when compared to the consumption of neighboring countries like Uganda[38] and Kenya,[39] that have annual per capita consumption of 58 liters and 110 liters, respectively. Milk is a key source of essential nutrients including proteins, calcium, and other crucial minerals and vitamins.[40] They are easily digested by children and adults for proper development of the brain, body, strong bones, energy and good eye sight. To address the problems associated with the absence or very low level of consumption of milk, Ethiopia needs to go long way in terms of boosting availability and access to dairy products by its population.

Meat consumption is usually associated with improvement in living standards, higher incomes and a shift to food consumption changes that favor increased proteins from animal sources.[41] An average Ethiopian adult consumes 7.4 kg of meat per year (6.1 kg per capita), which falls far below the per capita meat consumption for the Sub-Saharan Africa, 14 kg per year in the year 2007.[42] With an average annual per adult equivalent consumption of 13.4 kg of meat, Tigray ranks first followed by Addis Ababa (12 kg per year per adult equivalent), and SNNPR (10.8 kg per year per adult equivalent). The pastoral and agro-pastoral regions of Afar and Somali are the least consumers of meat as compared to the other regions.

The consumption of oils and fats is relatively higher in dominantly urban administrative areas of Addis Ababa, Dire Dawa, and Harari. The dominantly pastoral Somali region has also very high consumption of oils and fats compared to the national average. As displayed in Annex 2, oils and fats contribute around 15 percent of the calories consumed in Addis Ababa and Dire Dawa. In Harari and Somali, fats and oils contribute around 11 percent of the calories consumed. The least share of calories derived from oils and fats is observed in SNNPR (only 5 percent).

Vegetables and fruits are low in calories and fats but contain rich amounts of vitamins and minerals. On the average an adult in Ethiopia consumes 61 kg of vegetables, while per capita vegetable consumption stands at 50.2 kg per year. The consumption of vegetables is relatively high in SNNPR and Gambella. An average resident of SNNPR consumes 112.7 kg, 85 percent more vegetables compared to the national average. The average annual consumption of vegetables in Gambella region stands at 88 kg per adult equivalent, 44 percent above the national average. In the two major urban settings, Dire Dawa and Addis Ababa, have relatively higher consumption of vegetables. The two pastoralist and agro-pastoralist regions of Somali and Afar consume the least quantity of vegetables. The consumption of fruits is around 3.5 kg per adult or per capita 2.9 kg per person which is 4 percent of the recommended amount. Gambella, Tigray, Beneshangul-Gumuz, and SNNPR have relatively higher level of fruits consumption. The consumption of fruits is relatively higher in urban Ethiopia (4.5 kg per person per year) as compared to rural Ethiopia (2.5 kg per person per year). Compared to the WHO recommendations of vegetable and fruits consumption, which is around 400g per day per person (146 kg per person per year)[43],the average Ethiopian meets around 36.4 percent of the recommendation. This is clear indication of the fact that the great majority of Ethiopians are not adequately enjoying these relatively cheap sources of essential micronutrients and protectives against chronic diseases.

Table 4.3: Per capita and Per Adult Equivalent (PAE) of Quantities of food items and calories consumed by food items

Food Item/ Category	Per capita Quantity of food Consumed		PAE Quantity of Food Consumed		Per capita Calorie consumed		PAE Calorie consumed	
	Kg	% Share	Kg	% Share	Cal.	% Share	Cal.	% Share
Teff	32.6	8.2	39.6	8.2	295.3	12.0	358	12.0
Wheat	23.6	5.9	28.6	5.9	230.4	9.3	279	9.3
Barley	8.4	2.1	10.2	2.1	82.0	3.3	99	3.3
Maize	55	13.8	66.7	13.8	487.2	19.7	591	19.7
Sorghum	23.7	5.9	28.8	6.0	237.8	9.6	288	9.6
Other cereals	8.9	2.2	10.8	2.2	84.6	3.4	103	3.4
Processed Cereals (pasta, wheat flour, etc)	8.3	2.1	10.0	2.1	73.0	3.0	89	3.0
Total Cereals	**160.5**	**40.2**	**194.7**	**40.3**	**1490.3**	**60.3**	**1807**	**60.3**
Pulses	16.6	4.2	20.1	4.2	149.4	6.1	181	6.1
Oilseeds	0.2	0.1	0.2	0.0	2.4	0.1	3	0.1
Meat	6.1	1.5	7.4	1.5	15.8	0.6	19	0.6
Milk/Diary products	16.6	4.2	20.1	4.2	44.2	1.8	54	1.8
Other animal products (egg, fish, etc)	0.5	0.1	0.6	0.1	1.9	0.1	2	0.1
Root Crops	74.6	18.7	90.5	18.7	270.0	10.9	328	10.9
Spices	4.2	1.1	5.1	1.1	38.4	1.6	47	1.6
Sugar /Sweeteners	5.9	1.5	7.2	1.5	50.6	2.0	61	2.0
Oils and fats	7.1	1.8	8.6	1.8	174.0	7.1	211	7.1
Vegetables	50.2	12.6	60.9	12.6	47.5	1.9	58	1.9
Fruits	2.9	0.7	3.5	0.7	3.9	0.2	5	0.2
Soft drinks and Packed Juices	2.7	0.7	3.3	0.7	6.1	0.2	7	0.2
Alcoholic Beverages	24.6	6.2	29.9	6.2	114.2	4.6	139	4.6
Other foods	26	6.5	31.6	6.5	58.4	2.4	71	2.4
Total	398.7	100	483.7	100.0	2467.1	100.0	2993	100.0

Source: Computed from HCES 2016

Food Consumption basket by Expenditure Quintile and Place of Residence

The proportion of calories acquired from teff increases as people move from the lowest to the highest expenditure quintiles, suggesting that teff is the grain for the wealthier. The bottom quintile obtained 6 percent of their calories from teff while teff contributed 22 percent of calorie intake for the highest expenditure quintile (Q5). In contrast, maize is the primary source of calorie for the poor but less consumed by those in the higher quintiles. The lowest quintile (Q1) acquired 26 percent of their calorie intake from maize while contributing only 9 percent of calorie intake for the upper quintile. The share of sorghum and wheat as calorie sources is nearly identical among

the first four expenditure quintiles (Q1 to Q4) but dominant in rural areas as compared to urban ones.

The consumption of wheat across expenditure quintiles can be explained by two major sources of wheat in Ethiopia that reach the poor and the rich. The Government of Ethiopia imports wheat and sells it at subsidized prices to selected mills that eventually sell to retailers at a fixed price. The retailers then sell the subsidized bread to consumers which better-off households buy directly from the market. In addition, food aid agencies, like WFP, import a sizable amount of wheat and distribute it to food insecure households, including Productive Safety Nets Program (PSNP) beneficiaries. These households may also sell a portion of their food ration in the market adding to the availability of wheat in the market.

Sorghum is the single most important staple in drought prone areas of eastern and northwest-ern parts of Ethiopia. It is more widely traded in deficit, marginal and pastoral areas where transport and communication infrastructure are less developed.[44] Thus, the consumption of sorghum seems to be determined more by geographic location rather than by wealth quintiles. The share of oils and fats for calorie intake increases as one moves from lowest to highest expenditure quintiles.

The most important calorie sources in urban areas are primarily teff, oils and fats, constituting more than 40 percent of the calorie intake in urban Ethiopia. Oils and fats alone constitute 13 percent of calorie intake share of Urban Ethiopia, more than two-fold of the calorie intake share in rural Ethiopia. The most important calorie sources in rural Ethiopia are maize (23 percent), root crops (13 percent), sorghum (11 percent), and wheat (11 percent).

Table 4.4: Average daily Calorie intake per adult equivalent by source and expenditure Quintile and place of residence, 2016

Calorie Source	Expenditure Quintile										Place of Residence					
	Q1		Q2		Q3		Q4		Q5		Urban		Rural		Total	
	Cal	%	Cal	%	Cal	%	Cal	%	Cal	%	Cal	%	Cal	%	Cal	%
Teff	124	6	237	9	318	10	517	14	884	22	803	28	251	8	358	12
Wheat	229	11	284	11	314	10	337	9	234	6	109	4	321	11	279	9
Maize	548	26	654	25	695	22	622	16	347	9	161	6	695	23	591	20
Sorghum	229	11	271	10	335	11	376	10	236	6	131	5	327	11	288	10
Pulse	133	6	174	7	190	6	220	6	222	5	177	6	182	6	181	6
Root Crops	266	13	350	13	356	11	410	11	248	6	99	3	383	13	328	11
Oils and Fats	99	5	145	5	212	7	293	8	434	11	370	13	173	6	211	7
Others	453	22	552	21	698	22	1019	27	1449	36	998	35	698	23	756	25
Total	2082	100	2666	100	3120	100	3793	100	4054	100	2848	100	3028	100	2993	100

Source: Computed from HCES 2016

The data presented in Table 4.5 suggests marked difference between rural and urban areas in terms of per capita consumption pattern of different food items. The per capita intake of teff in urban areas is almost 3 and half times more than the per capita consumption in rural areas. The per capita consumption of processed cereals (pasta, wheat flour, etc.), oils and fats, vegetables, soft drinks and packed juices, oils and fats, meat is substantially higher in urban areas as compared to rural areas. On the other hand, rural areas have significantly higher per capita consumption of wheat, barley, maize, sorghum, root crops, milk/ dairy products.

Food item	Urban		Rural		Total	
	Kg	% Share	Kg	% Share	Kg	% Share
Teff	78	20.7	21.9	5.4	32.6	8.2
Wheat	9.7	2.6	26.9	6.7	23.6	5.9
Barley	3	0.8	9.7	2.4	8.4	2.1
Maize	15	4.0	64.4	15.9	55	13.8
Sorghum	10.9	2.9	26.8	6.6	23.7	5.9
Other cereals	8.2	2.2	9.1	2.3	8.9	2.2
Processed Cereals (pasta, wheat flour, etc)	25.9	6.9	4.1	1.0	8.3	2.1
Pulses	15.7	4.2	16.8	4.2	16.6	4.2
Oilseeds	0.1	0.0	0.2	0.0	0.2	0.1
Meat	11.5	3.1	4.8	1.2	6.1	1.5
Milk/Diary products	9.5	2.5	18.3	4.5	16.6	4.2
Other animal products (egg, fish, etc)	1.3	0.3	0.3	0.1	0.5	0.1
Root Crops	30.7	8.1	84.9	21.0	74.6	18.7
Spices	5.3	1.4	3.9	1.0	4.2	1.1
Sugar /Sweeteners	9	2.4	5.2	1.3	5.9	1.5
Oils and fats	12.7	3.4	5.8	1.4	7.1	1.8
Vegetables	64	17.0	46.9	11.6	50.2	12.6
Fruits	4.5	1.2	2.5	0.6	2.9	0.7
Soft drinks and Packed Juices	9.5	2.5	1.1	0.3	2.7	0.7
Alcoholic Beverages	38.4	10.2	21.4	5.3	24.6	6.2
Other foods	14.1	3.7	28.9	7.2	26	6.5

Source: Computed from HCES 2016

Trends of Food Consumption baskets

The starchy staples, cereals and roots, are generally the cheapest source of calories, while cereals are one of the cheapest sources of protein. As a result, they make up a high proportion of food intake in poor countries like Ethiopia. Over the past twenty years' period from 1995 to 2016, the consumption of cereals has continued to increase but at a decelerating rate. The per average per adult equivalent annual cereal consumption increased 31 percent from 149 kg in 1995 to 195 kg in 2018. Conversely, the share of calories acquired from cereals decreased from 66.7 percent to 60.4 percent during the same period. The consumption of the other staples, such as root crops and tubers, showed a steady increase but the share of calories from these food groups showed a slight decrease. Generally, the average per adult equivalent quantities of starchy staples consumed have increased over the past two decades but the share of the calories shows a slight decrease. The most rapid increase in the average quantities of starchy staples was recorded between 1995 and 2000. This pattern is in line with expectation given the overall increase in the annual real consumption per adult equivalent from 4,150 Birr in 1995/6 to 12,391 Birr in 2016 (both in 2011 price terms).

Table 4.6: Trends of starch staples consumption in Ethiopia – (Kg and calories per adult equivalent per year) (1996-2016)

Year	Cereals			Root Crops			Total Starch Staples		
	Kg/AE/Year	Calories	Calories (% share)	Kg/AE/Year	Calories	Calories (% share)	Kg/AE/Year	Calories	Calories (% share)
1996	149	1465	66.7	28	130	5.9	155	1595	72.6
2000	180	1784	65.1	99	445	16.3	196	2229	81.4
2005	187	1745	61.3	86	384	13.4	200	2129	74.7
2011	192	1854	61.8	88	410	13.7	206	2264	75.5
2016	195	1808	60.4	91	328	11.0	206	2136	71.4

Source: Computed from HCE Surveys

Figure 4.4 illustrates the changes in the average quantity of different cereals consumed per adult equivalent over the past twenty years. The consumption of maize, the cheapest cereal, increased 63 percent from 1996 to 2016. During the same period, the average quantity of teff, the most expensive cereal, consumed by Ethiopian population increased by 29 percent. The average quantity of wheat and sorghum consumed per an adult rose steadily until 2005 but showed consistent decline since then.

Figure 4.4: Trends of cereal consumption in Ethiopia -Kilogram per adult equivalent per year (1996-2016)
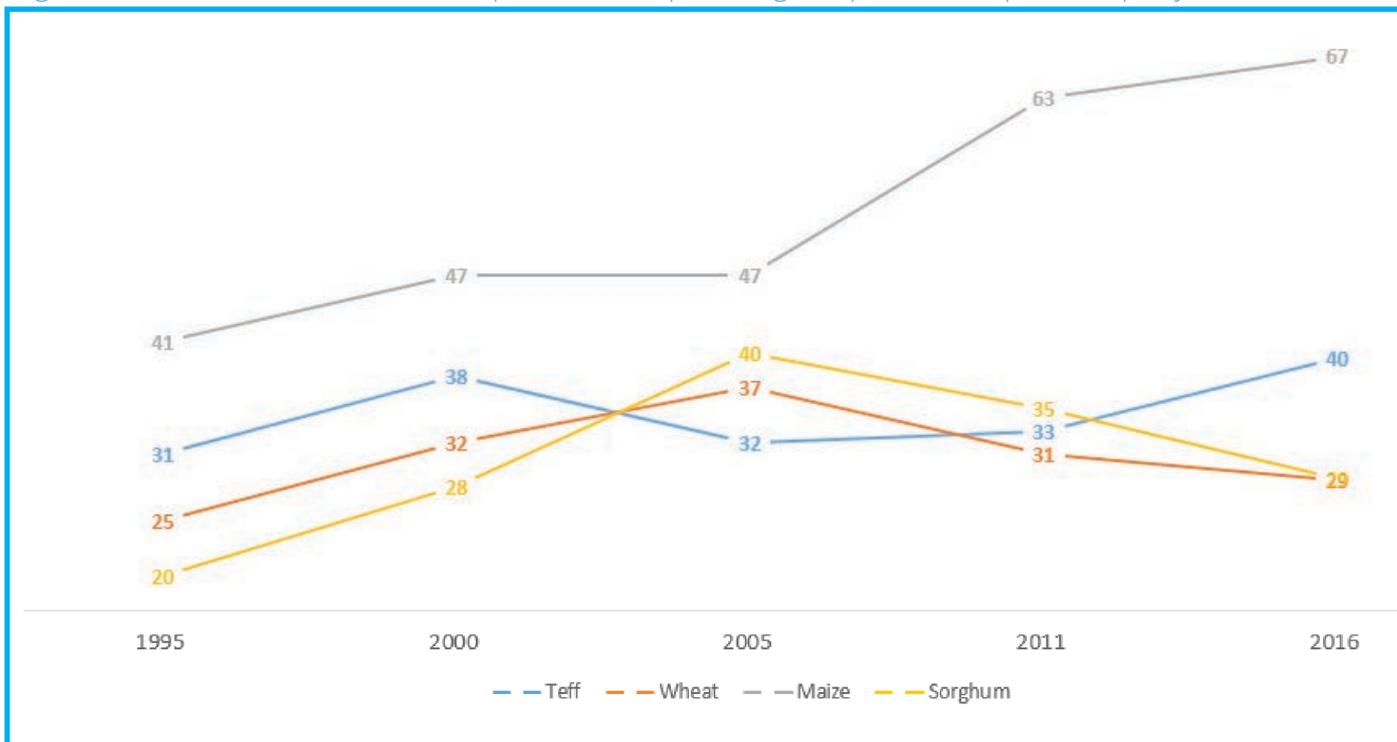
Source: Computed from HCE surveys

As displayed in Figure 4.5, consumption of vegetables and fruits increased steadily from 1996 to 2011 and rose rapidly between 2011 and 2016. The quantity of fruits and vegetables consumed by an average adult shown a two-fold increase from around 31 kg in 1996 to 64.4 kg in 2016. This may be the reflection of behavioural change towards the consumption and the increased availability of fruits and vegetables.

The consumption of animal products, including meat, poultry, fish, milk and dairy products, eggs, showed an increase of 65 percent over the twenty years period, suggesting improvement of standard of living of the population; while the consumption of pulses stagnated with a general downward trend, which is not surprising given the high increase recorded in the prices of pulses.

Figure 4.5: Trends of average quantity of food groups' consumption in Ethiopia-Kg per adult equivalent per year (1996-2016)
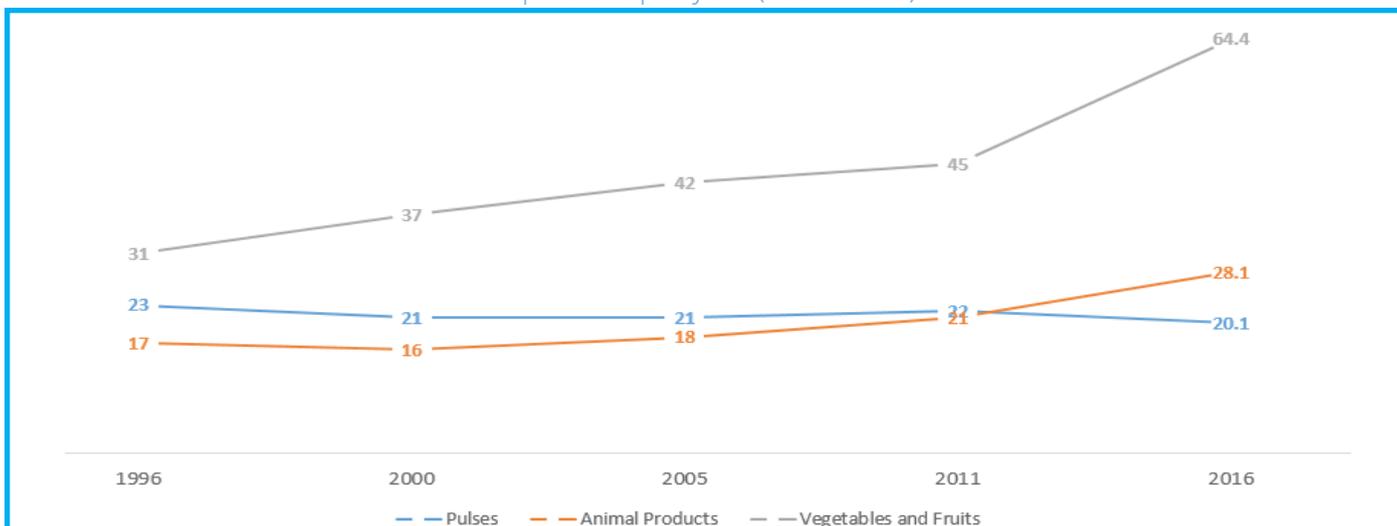
Source: Computed from 2016 HCES

Dietary Diversity Score (DDS)

A dietary diversity score is a proxy indictor for measuring household food access. It is meant to reflect, in a snapshot form, the economic ability of a household to access a variety of foods. It shows the number of different food groups consumed over a given reference period. DDS is an important proxy indictor due to a more diversified diet is highly correlated with such factors as caloric and protein adequacy, percentage of protein from animal sources (high quality protein), and household income. Even in very poor households, increased food expenditure resulting from additional income is associated with increased quantity and quality of the diet.

Nationally approximately 54 percent of households consume four or fewer food groups out of seven during the seven days prior to the date of interview and 18 percent three or fewer. A higher proportion of rural households consumed less diverse diets as compared with urban households (21.4 percent rural households and 7 percent urban households consumed three or fewer food groups). The highest percentage of households consumed three or fewer food groups was found in Somali Region (56 percent) followed by Afar (41 percent), and SNNPR (23 percent). This could be related to the 2015 El Niño drought and the 2016 IOD drought that hit the southern and southeastern part of the country (Southern Somali region, Sothern SNNPR, Southern pastoral areas of Oromia region), resulting in severe reduction of livestock, a main source of income particularly in pastoral areas in Afar and Somali regions.

Figure 4.6: Percentage of households reported consumption of three or fewer food groups (out of seven) by region and place of residence
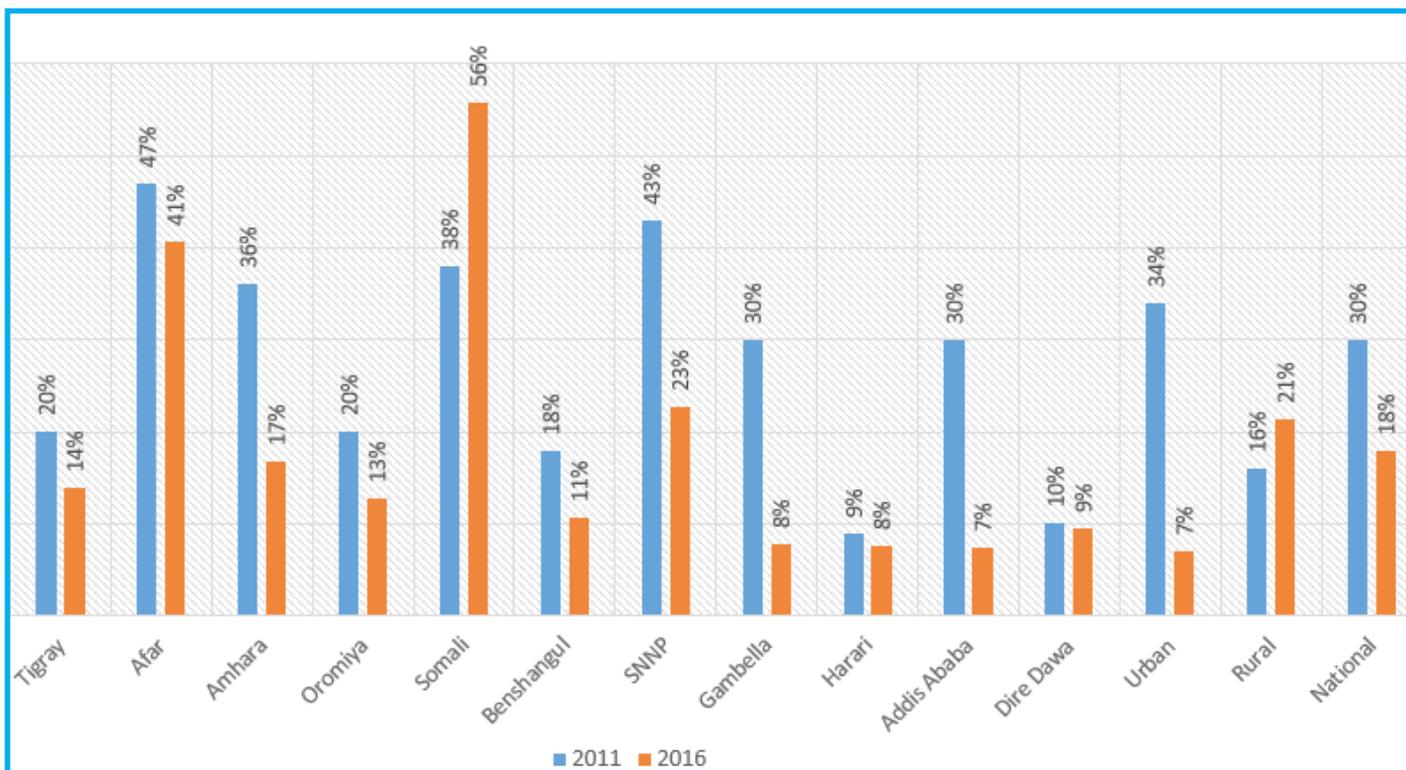
Source: Computed from 2016 WMS

The percent of households that reported consumption of three or fewer food groups out of seven during the seven days prior to the date of interview was reduced in 2016 as compared to 2011, with the except for Somali Region (Figure 4.6). The highest decrease in the percent of households who consumed less than three food groups was reported from Gambella (26 percentage point) followed by Amhara and SNNPR (21 percentage point each). The

proportion of households reported consuming three or fewer food groups was high in Afar and Somali region and more than 40 percent of the interviewed households in these regions reported consuming less than three food groups. The relative improvement as compared to 2011 could be an indication of an improvement in a number of households consuming a variety of food groups as compared to 2011. In Somali region, the proportion of households who

consumed three or fewer food groups out of seven increased by 16-percentage point as compared to 2011. In this region, the increase could be attributed to consecutive drought in 2015 and 2016 that had affected households' livestock herd size and consequently the income and food generated from livestock.

Table 4.7: Mean number of days of consumption (out of 7) of all food groups by region

Region	Starch	Pulses	Vegetables	Fruits	Meat	Dairy	Oil and fat	Sugar
Tigray	7.0	3.8	6.4	0.5	1.6	1.0	6.2	4.7
Afar	7.0	2.0	4.8	0.3	0.7	3.3	5.1	4.5
Amhara	6.9	5.4	6.7	0.2	0.8	0.6	5.7	2.0
Oromia	6.9	4.1	6.4	0.6	0.8	2.0	6.3	2.8
Somali	6.9	0.7	3.0	0.3	0.5	5.1	5.5	6.8
Benshangul-Gumuz	7.0	4.8	6.4	1.1	0.9	0.7	6.0	2.9
SNNPR	6.9	2.4	6.1	1.0	0.7	1.4	5.4	1.2
Gambella	7.0	2.5	6.5	1.1	2.7	1.8	6.2	3.2
Harari	6.8	3.7	6.6	0.8	1.6	2.6	6.5	5.5
Addis Ababa	7.0	3.7	6.9	1.3	1.9	1.4	6.9	5.6
Dire Dawa	7.0	2.7	6.1	1.2	1.6	2.3	6.4	6.2
Rural	6.9	3.9	6.1	0.4	0.6	1.7	5.6	2.1
Urban	6.9	4.0	6.7	1.1	1.8	1.4	6.7	4.9
National	6.9	3.9	6.3	0.6	0.9	1.6	5.9	2.8

Source: Computed from 2016 WMS

At national level, staples/starch was consumed for approximately 7 days in a week during the seven days prior to the date of interview, followed by vegetables and oil and fat group as reported by the interviewed households (Table 4.7). There is no difference in consumption of staples by areas of residence. It was consumed for nearly 7 days on average in all areas of residence during the seven days before the date of interview. Meat and fruit groups were reported to be consumed for less than a day in week on average. Fruits, meat, oil and sugar groups were consumed more in urban areas on average whereas the dairy product consumed slightly higher in rural areas than in the urban areas on average (Table 4.7). Comparison by region show sugar was the most frequently consumed food group next to staples in Somali (6.8 days), Dire Dawa (6.2 days), Addis Ababa (5.6 days) and Harari (5.5 days).

The national average number of days meat group (meat, fish and egg) consumed during a week prior to the date of interview was 0.9 days. On average, the meat group was consumed for 2.71 days in a week in Gambella, 1.9 days in a week in Addis Ababa, 1.64 days a week in Dire Dawa, 1.58 days in a week in Tigray and 1.55 days in a week in Harari. Meat consumption was for less than a day in a week during the seven days prior to the date of interview in all other regions (Table 4.7).

The national average number of days milk and milk products consumed during a week prior to the date of interview was 1.6 days. The average number of days milk and milk products consumed was higher in Somali (5.1 days in a week) followed by Afar (3.3 days in a week) and Harari (2.6 days in a week) as reported by the interviewed households (Table 4.7).

Table 4.8: Mean number of days of consumption (out of 7) of all food groups by food consumption groups (FCG)

Food Consumption Groups	Starches	Pulses	Vegetables	Fruits	Meat	Dairy	Oil and fat	Sugar
Poor	6.2	0.1	2.8	0.1	0.0	0.0	1.2	1.0
Borderline	6.9	1.1	6.3	0.3	0.2	0.2	5.5	1.8
Acceptable	7.0	4.8	6.4	0.7	1.1	2.0	6.2	3.1

Source: Computed from 2016 WMS

Comparing by food consumption groups, staples were consumed for nearly seven days in a week by households in acceptable and borderline food consumption groups and for about six days in a week prior to the date of interview by households in poor food consumption groups. Households with an acceptable FCS tend to consume more of all food groups as compared to the borderline and the poor food consumption groups. For example, the acceptable group consumes pulses for 4.75 days, vegetables for 6.43 days, fruits for 0.66 days meat for 1.13 days, dairy product for 2.02 days, oil and fat for 6.21 days and sugar for 3.12 days on average whereas the borderline consumed pulses only for 1.08 days and dairy product for 0.17 days on average. The households in poor food consumption group consumed cereals for 6.17 days, vegetables for 2.83 days, oil for 1.21 days, sugar for 1 day, pulses for 0.13 day on average (Table 4.8).

Table 4.9: Mean number of days each food group consumed by wealth quintile (National)

Wealth Index Quintile	Staples (starch)	Pulses	Vegetable	Fruits	Meat	Dairy product	Oil and fat	Sugar
Poorest	6.9	3.0	5.3	0.2	0.4	2.3	4.9	2.3
Poorer	6.9	3.9	6.1	0.3	0.5	1.6	5.6	2.1
Middle	6.9	4.3	6.5	0.3	0.6	1.4	6.1	2.2
Rich	7.0	4.7	6.7	0.4	0.9	1.5	6.4	2.6
Richest	7.0	4.4	6.7	0.9	1.8	1.4	6.7	4.7

Source: Computed from 2016 WMS

As presented in Table 4.9, households in richest wealth index quintile tend to consume more diverse (quality foods) as compared to the poorest quintiles. The poorest (asset poor) households, on average mainly consume staples for seven days in a week and pulses for (2.95 days), oil and fat for (4.87 days) and sugar for (2.33 days) and exceptionally dairy product for about 2.27 days which was higher than the richest quintile. This is mainly due to about 62 percent of pastoral and 20 percent of mixed agriculture livelihood dependent households who consumed dairy product for 5 and 2.2 days in a week, respectively are in poorest wealth index quintile (Table 4.10). This shows that households milk consumption in Ethiopia is more associated with livelihood of the community than the wealth. This is in line with similar study conducted using 2011 WMS that had also indicated milk consumption had no strong association with wealth but livelihoods.

In contrary, meat consumption showed correlation with wealth and the asset rich households reported meat consumption for an average of two days in a week whereas the poorest households consumed meat for an average of less than a day in a week (Table 4.9).

Table 4.10: Proportion of households reported dairy product consumption by livelihood and wealth index

Major Livelihood	Wealth Index				
	Poorest	Poorer	Middle	Rich	Richest
Salary	2.1	2.3	2.2	8.4	85.0
Causal Labour/ Daily laborer	15.7	11.9	10.3	19.5	42.5
Crop production	20.3	24.8	25.2	22.4	7.3
Livestock (including Poultry and Bee)	62.0	22.7	7.5	3.4	4.4
Crop and Livestock (at comparable level)	20.0	22.2	25.5	26.0	6.3
Manufacturing, Construction, Mining & Quarry Industry Informal	3.5	12.0	15.2	16.4	52.9
Whole sale & Retail Trade - Informal Sector	5.9	9.5	12.1	17.8	54.7
Service Trade - Informal Sector	10.4	11.6	8.6	14.4	55.0
Renting of House, Land plot, Equipment, Machinery, Storage	23.9	32.4	14.8	8.7	20.1
Social Security (Pension, Provident fund etc.)	3.7	0.0	1.8	3.0	91.5
Remittance	13.5	10.1	7.6	13.2	55.7

Source: Computed from 2016 WMS

Figure 4.7. Mean number of days dairy product consumed by wealth group and area of residence
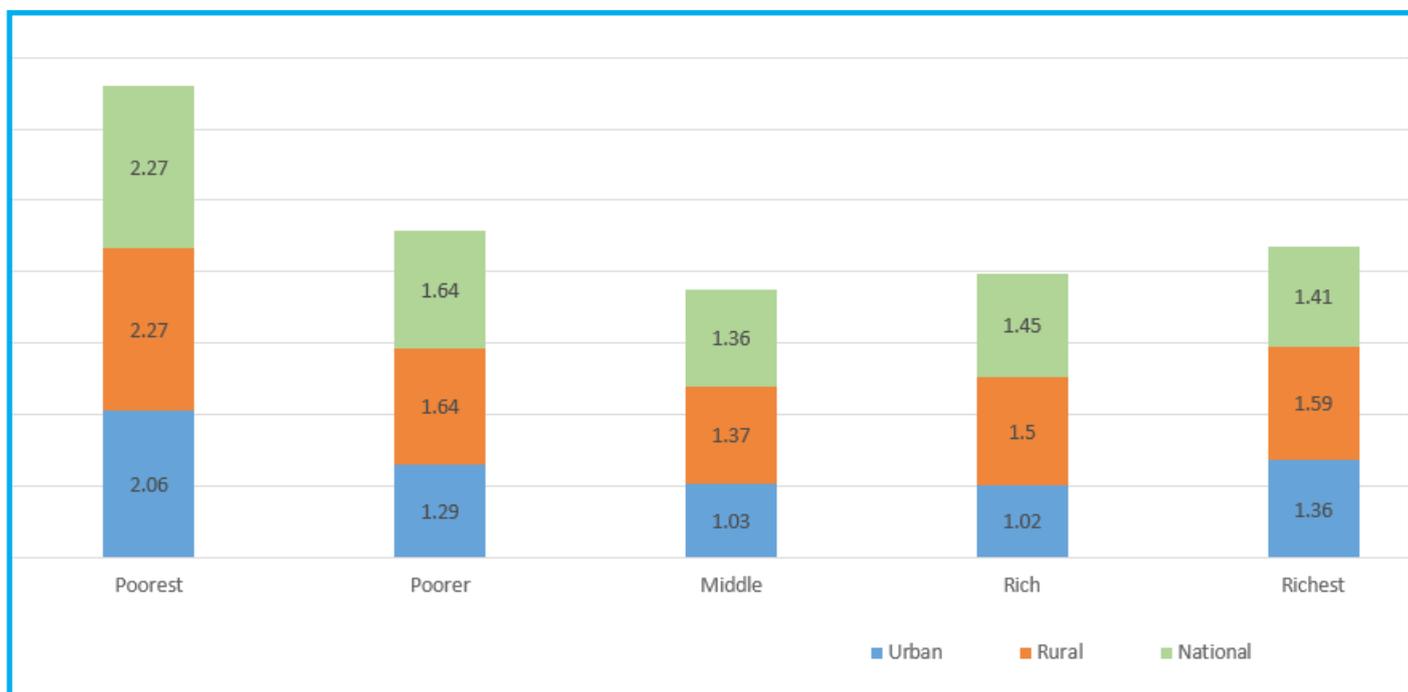
Source: Computed from 2016 WMS

In both urban and rural areas, the poorest wealth index quintile households consume dairy product for more number of days than their respective asset rich quintile (rich wealth index) households (Figure 4.7). Likewise, the rural richest wealth index quintile households consume dairy product for more number of days than the richest wealth index quintiles in urban areas. This also evidenced that dairy product consumption had no strong association with wealth.

Table 4.11: Mean number of days each food group consumed by wealth quintile (Urban and Rural)

Area of Residence	Wealth Index Quintiles	Staples (starch)	Pulses	Vegetable	Fruits	Meat	Dairy product	Oil and fat	sugar
Urban	Poorest	6.7	2.5	4.5	0.5	0.1	2.1	5.6	3.9
	Poorer	6.9	3.4	5.6	0.2	0.5	1.3	5.8	3.6
	Middle	6.8	3.9	6.2	0.3	0.6	1.0	6.0	3.4
	Rich	6.9	4.0	6.3	0.5	0.9	1.0	6.3	3.4
	Richest	7.0	4.3	6.8	1.1	1.8	1.4	6.8	5.1
Rural	Poorest	6.9	3.0	5.3	0.2	0.4	2.3	4.9	2.3
	Poorer	6.9	3.9	6.1	0.3	0.5	1.6	5.6	2.0
	Middle	6.9	4.4	6.5	0.3	0.6	1.4	6.1	2.1
	Rich	7.0	4.8	6.7	0.4	0.9	1.5	6.4	2.5
	Richest	6.9	4.6	6.7	0.6	1.6	1.6	6.6	3.5

Source: Computed from 2016 WMS

There is no marked difference between urban and rural areas wealth groups on number of days the basic food groups (staples, pulses and vegetable) consumed (Table 4.11). From the three, staples and vegetables are the cheapest food groups in most parts of Ethiopia. The price of pulses is relatively high, but, in spite of its price, pulses are part of many Ethiopians' main dish in its different form. Moreover, many of the poor targeted by humanitarian assistance might have received as food assistance ration.

The analysis of types of food groups consumed by different livelihood groups showed that some food consumption depends on the major livelihood (main source of income) of the house-holds (Table 4.12). For instance, dairy product had been consumed for more number of days (5.18 in a week) by households who reported livestock as main source of income and followed by mixed agriculture (livestock and crop production) dependent households. This shows that dairy product consumption had an association with livelihood but not wealth in Ethiopia context. On the average, salaried households and households engaged in service sector tend to consume meat and fruits for more number of days as compared to the other livelihood/ occupation categories. Households relying on social security, livestock, remittance, household making a living on renting of house, land plots, and casual labour consume the least fruits and meat.

Table 4.12: Mean number of days of consumption (out of 7) of all food groups by main occupation/Livelihoods

| Livelihoods /Occupation	Staples (starch)	Pulses	Vegetable	Fruits	Meat	Dairy product	Oil and fat	Sugar
Salary	7.0	3.9	6.3	0.6	1.4	1.9	6.6	3.9
Causal labour/Daily laborer	6.9	3.3	5.9	0.3	0.5	0.8	5.4	2.5
Crop production	6.9	3.9	6.4	0.4	0.6	1.4	5.7	1.7
Livestock	6.8	1.4	2.6	0.0	0.3	5.2	4.5	5.8
Crop and Livestock	7.0	4.1	6.3	0.5	0.8	2.2	5.7	2.4
Manufacturing, Construction, Mining	7.0	4.3	6.3	0.5	0.7	0.7	5.8	1.8
Whole sale & Retail Trade - Informal Sector	7.0	3.6	6.6	0.4	0.6	1.5	6.4	2.6
Service Trade - Informal Sector	6.7	2.3	5.8	0.8	1.3	0.8	6.0	2.8
Renting of House, Land plot	7.0	5.3	6.1	0.0	0.5	0.3	4.3	0.6
Social Security (Pension, Provident fund etc.)	7.0	3.8	6.5	0.0	0.0	0.1	6.0	3.0
Remittance	7.0	5.5	7.0	0.0	0.3	1.3	6.7	4.8

Source: Computed from 2016 WMS

Food Consumption Score and Dietary Adequacy

Food consumption score (FCS)[45] is a composite score based on the dietary diversity, food frequency, and relative nutritional importance of the various food groups consumed. Food consumption groups are created from the FCS based on standard thresholds that subsequently divide households into three groups: poor food consumption, borderline food consumption and acceptable food consumption. Households with a FCS of less than 21 are categorized in to poor food consumption group as this score indicates a consumption of only staples and vegetables for few days. The households with borderline food consumption group are group of households with FCS ranging from 21.01 to 34.99. A FCS within this band assumes daily consumption of staples and vegetables complemented by consumption of oil and pulses four days per week. This diet is still very lacking in proteins, particularly animal proteins.

The households in acceptable food consumption group are those who have FCS of 35 and above. An FCS within this band assumes daily consumption of proteins, particularly animal protein in addition to the other food groups. Households in this group are considered having adequate food consumption while those in the borderline and poor groups are considered as group of households with inadequate food consumption (inadequate diet quantity).

Figure 4.8: Percent distribution of households by Food Consumption Score (FCS) groups, 2016

Acceptable   Inadequate
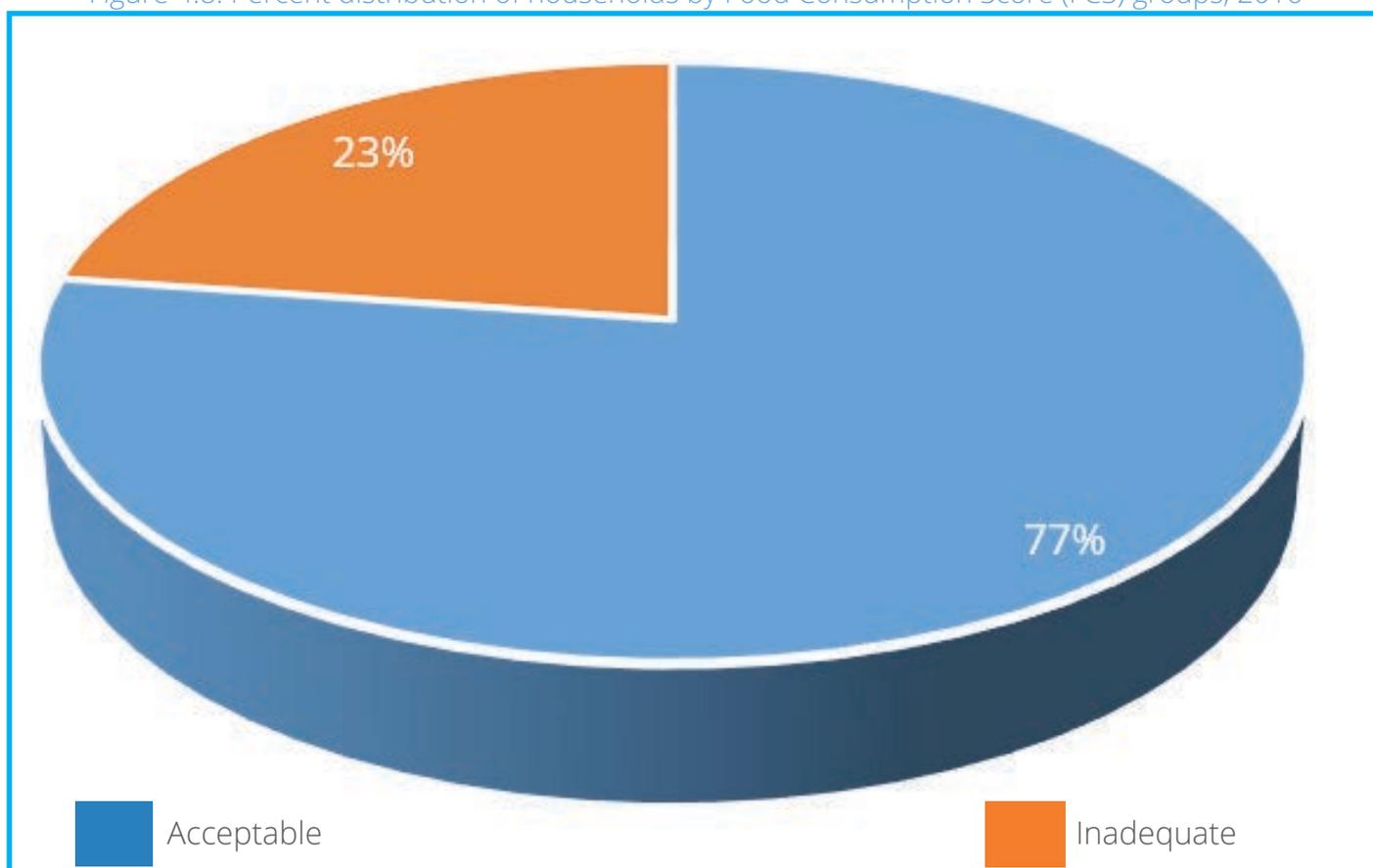
Source: Computed from 2016 WMS

As presented in Figure 4.8, nationally, approximately 77 percent of the households had acceptable food consumption during the seven days prior to the date of interview. Nearly one in four households interviewed (23 percent) had inadequate food consumption, i.e., consumed less than the acceptable variety of foods and/or only consumed foods with less nutritional values (poor micronutrient, low-quality protein) and 31 percent had reported consuming energy deficient food.

The proportion of households with inadequate food consumption was higher in rural areas (25 percent) as compared to the urban areas (14 percent), Figure 4.9. This could be due to a high proportion of richest households in the urban areas as compared to rural areas (approximately 74 percent of households in urban areas were in the richest wealth quintile whereas only 5 percent were in the poorest to the middle quintiles altogether).

By region, Harari region had the lowest percentage of households with inadequate food consumption (10 percent) and SNNPR the highest percentage of households with inadequate food consumption (46 percent) followed by the Afar region (31 percent), Figure 4.9. There is a slight reduction in the proportion of households with inadequate food consumption both in rural and urban areas and at the national level as compared to the 2011 survey period (Figure 6).

Figure 4.9: Percentage of households with inadequate (Poor + Borderline) food consumption score by Region and Place of Residence
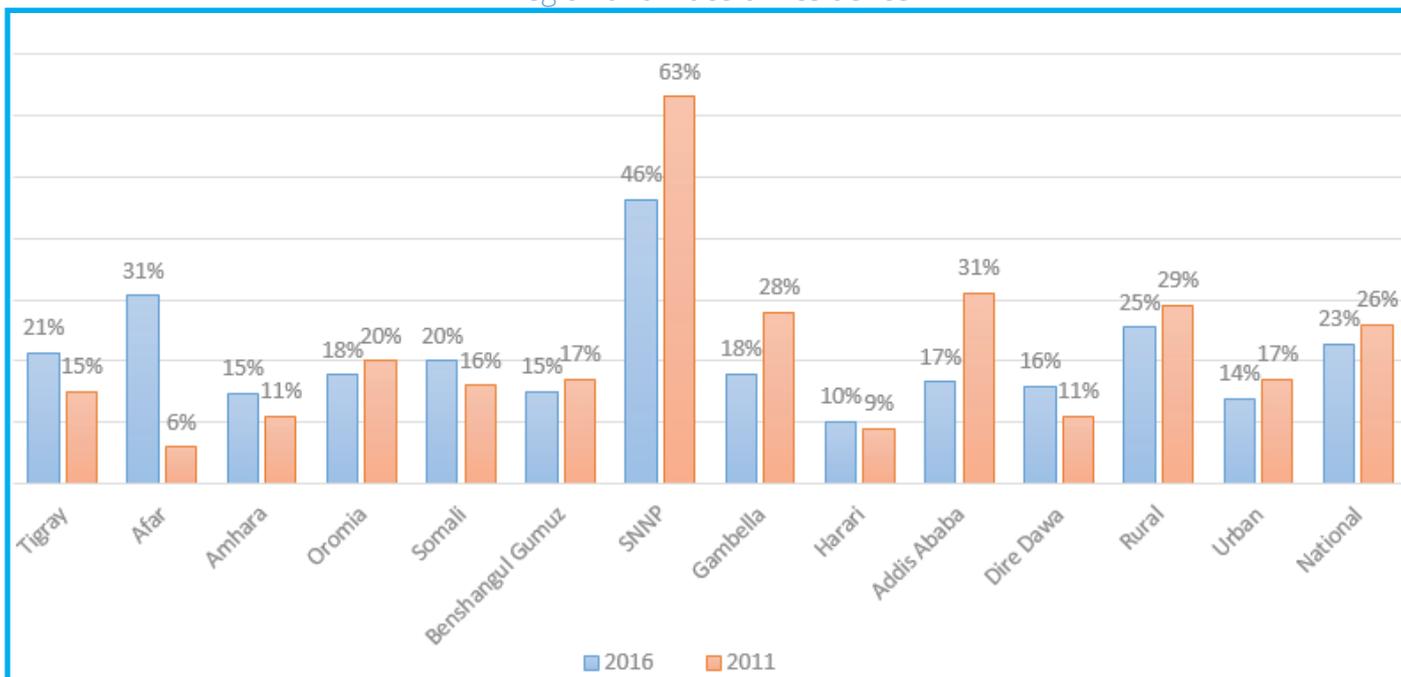
Source: Computed from 2016 WMS

Table 4.13: Food consumption groups by region and areas of residence (Rural and Urban)

Region	Rural		Urban	
	Acceptable	Inadequate	Acceptable	Inadequate
Tigray	75.4	24.6	86.6	13.4
Afar	74.4	25.6	54.7	45.3
Amhara	83.3	16.7	92.8	7.2
Oromia	80.5	19.5	90.0	10.0
Somali	80.8	19.2	75.1	24.9
Benishangul-Gumuz	84.2	15.8	87.5	12.5
SNNPR	48.6	51.4	76.7	23.3
Gambella	80.9	19.1	84.1	15.9
Harari	87.9	12.1	90.8	9.2
Addis Ababa	-	-	83.4	16.6
Dire Dawa	83.0	17.0	84.5	15.5
National	74.5	25.5	85.9	14.1

Source: Computed from 2016 WMS

There was a high proportion of urban households reported inadequate food consumption in Afar (46 percent) as compared to urban areas in other regions. The lowest proportion of urban households with inadequate food consumption reported from Amhara region (7 percent). In the rural areas in the regions, the highest proportion of households with inadequate food consumption reported from SNNPR (51 percent) while the lowest is from the Harari region (12 percent), Table 4.13. Households with poor food consumption mainly consume staples, vegetables, oil and sugar whereas households with acceptable food consumption consume diverse food groups, including milk for about a day in a week and meat for approximately two days in a week.

In the Map, figure 4.10, green dots indicate statistically significant hotspots (high FCS), while, red dots represent significant cold spot areas (low FCS). The hotspot analysis[46] in figure 4.10 depicts that the clustering of low FCS in Northern and South western parts of Somali region, Eastern parts of SNNPR, South Eastern Amhara region, and North Western and North Eastern parts of Oromia region.

Figure 4.10: Spatial Clustering of high and low food consumption score
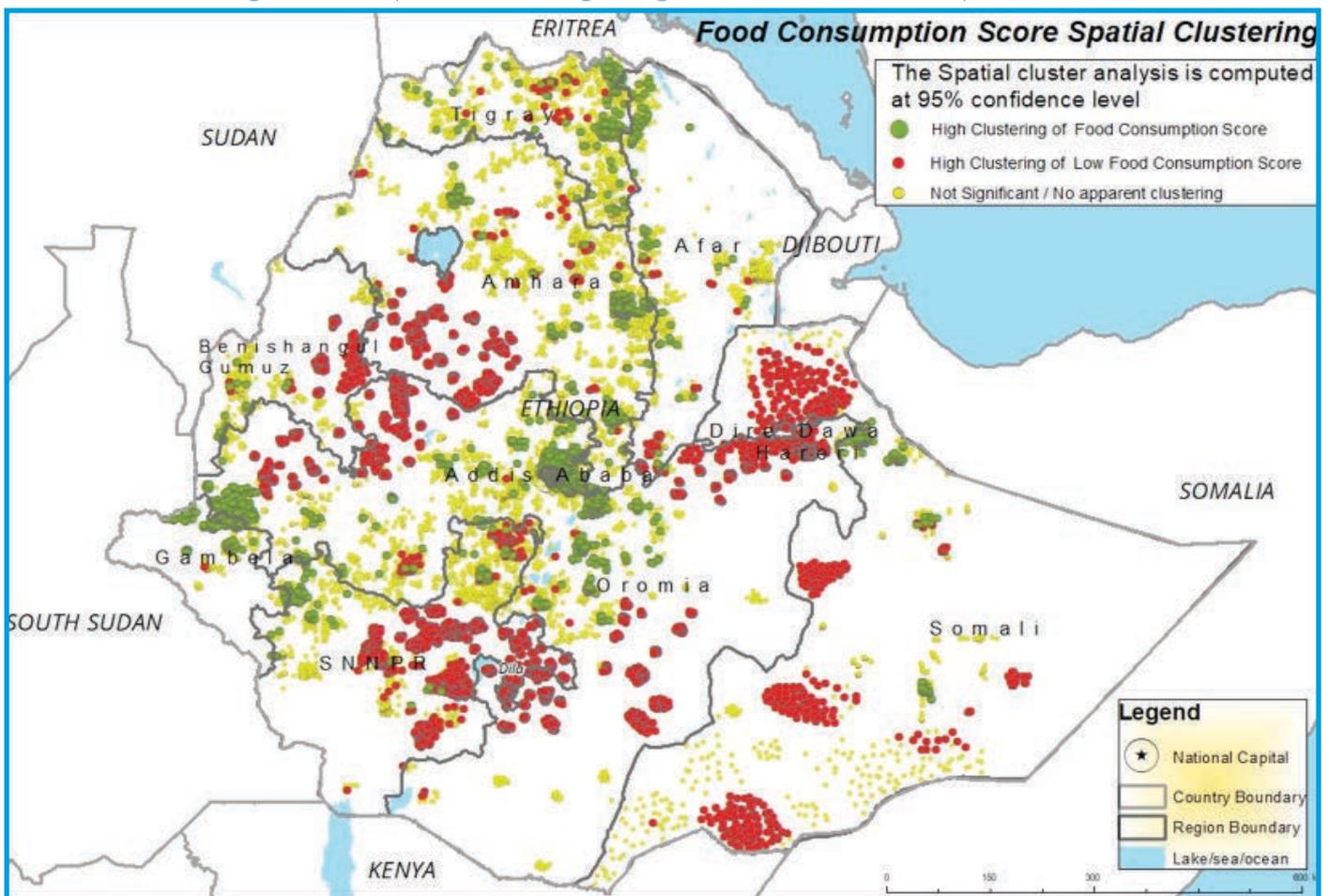
Source: Computed from 2016 WMS

Table 4.14: Food Consumption group by wealth quintile

Wealth Index Quintile	Poor	Borderline	Acceptable
Poorest	7	24	70
Poorer	4	22	73
Middle	2	20	78
Rich	1	13	86
Richest	1	10	90

Source: Computed from 2016 WMS

A cross tabulation of wealth index with food consumption groups show that wealth index is strongly associated with food consumption and asset poor households had tend to have higher proportion of households with inadequate food consumption as compared to the asset rich households (Table 4.14), however, the asset poor household also have good proportion of households with adequate food consumption whereas on the other hand, there were asset rich households with inadequate food consumption. This could be an indication for food consumption is not only depends on food access but also feeding practices.

Figure 4.11: Percentage of households had inadequate food consumption by region and place of residence
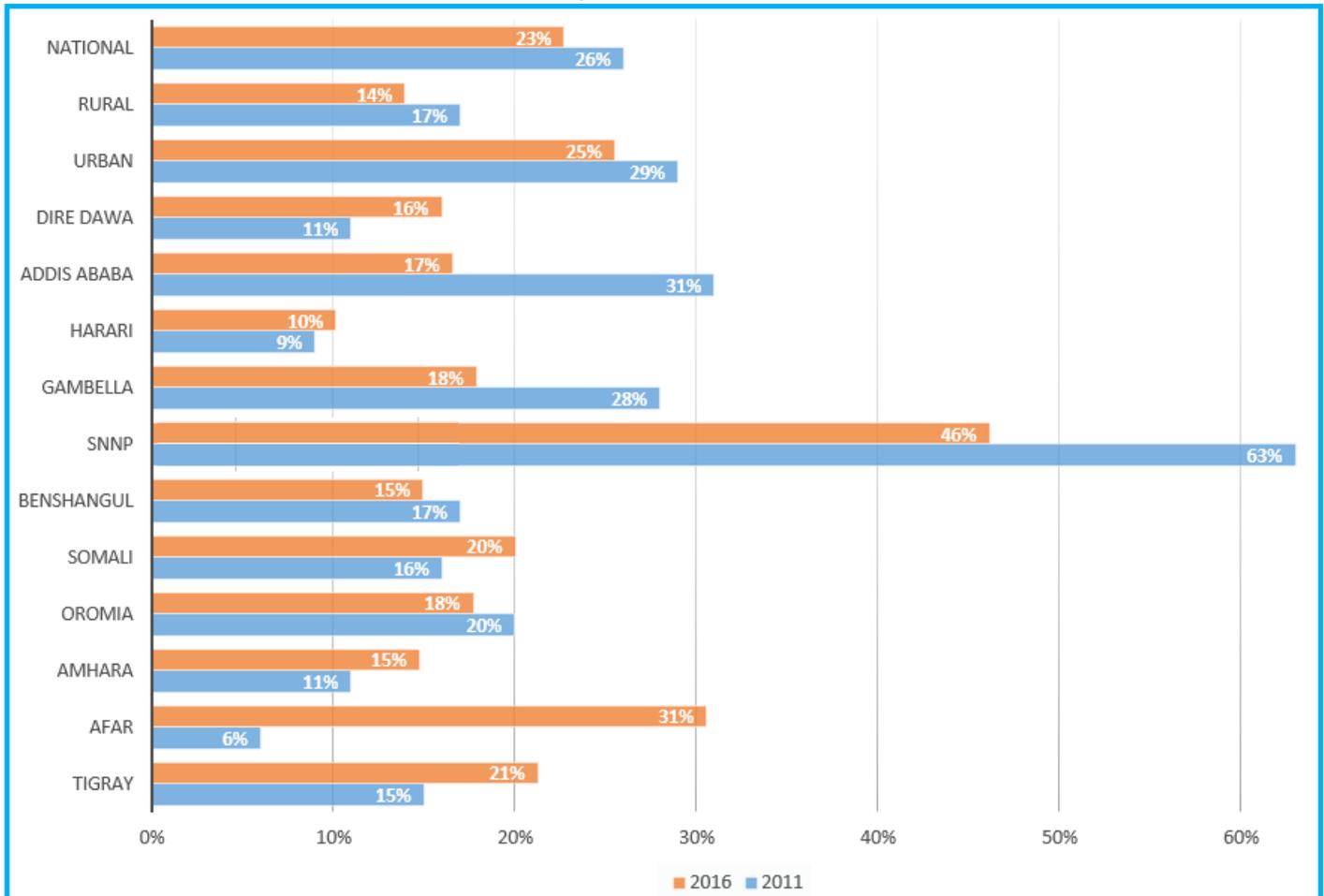
Trend analysis shows that there was an increase in the proportion of households with inadequate food conumpation during the seven days prior to the date of interview in Tigray (6-percentage point), Afar (25-percentage point), Somali (4-percentage point) and Dire Dawa (5-percentage point) on avarge as compared to the seven days prior to the same survey conducted in 2011. The proportion of households with inadequate food consumption decreased in the remaining regions as compared to the seven days prior to the same survey conducted in 2011 (Figure. 4.11). A high proportion of households with inadequate food was reported from SNNPR in both survey years, however, there was a significant decrease in the percent of households with inadequate food consummation in SNNPR (17-percentage point) followed by Gambella (11 percentage point). Tigray and Afar are regions with a relatively high percentage share of cereals for calorie intake which is energy dense but poor in protein and consequently given low weight in FCS calculation (Table 4). In Somali region, the interviewed households reported that they consume less diverse food as compared to other regions (nearly 56 percent consume less than three food groups) and hence a decrease in FCS likely related to the variety food consumed (Figure 4.6).

A decrease in the proportion of households with inadequate food consumption could be related to a relative improvement in households' food access and/or change in feeding practice as compared to the 2011 survey period. Harari had the lowest proportion of households with inadequate food consumption as compared to other regions. Overall, there was a 3-percentage point decrease in the proportion of households with

poor food consumption as compared to the seven days prior to the survey conducted in 2011 (Figure 4.11).

A cross-tabulation of FCS with the wealth index quintile indicates an increase in the proportion of households with adequate food consumption with an increase in wealth (poorest to richest wealth quintiles) as measured by wealth index (Figure 4.12). This is in line with the the findings that the households in the richest quintile consumed more diverse food and higher amount of calorie as compared to the households in the poorest quintile.

Figure 4.12: Food Consumption Group by Wealth Index
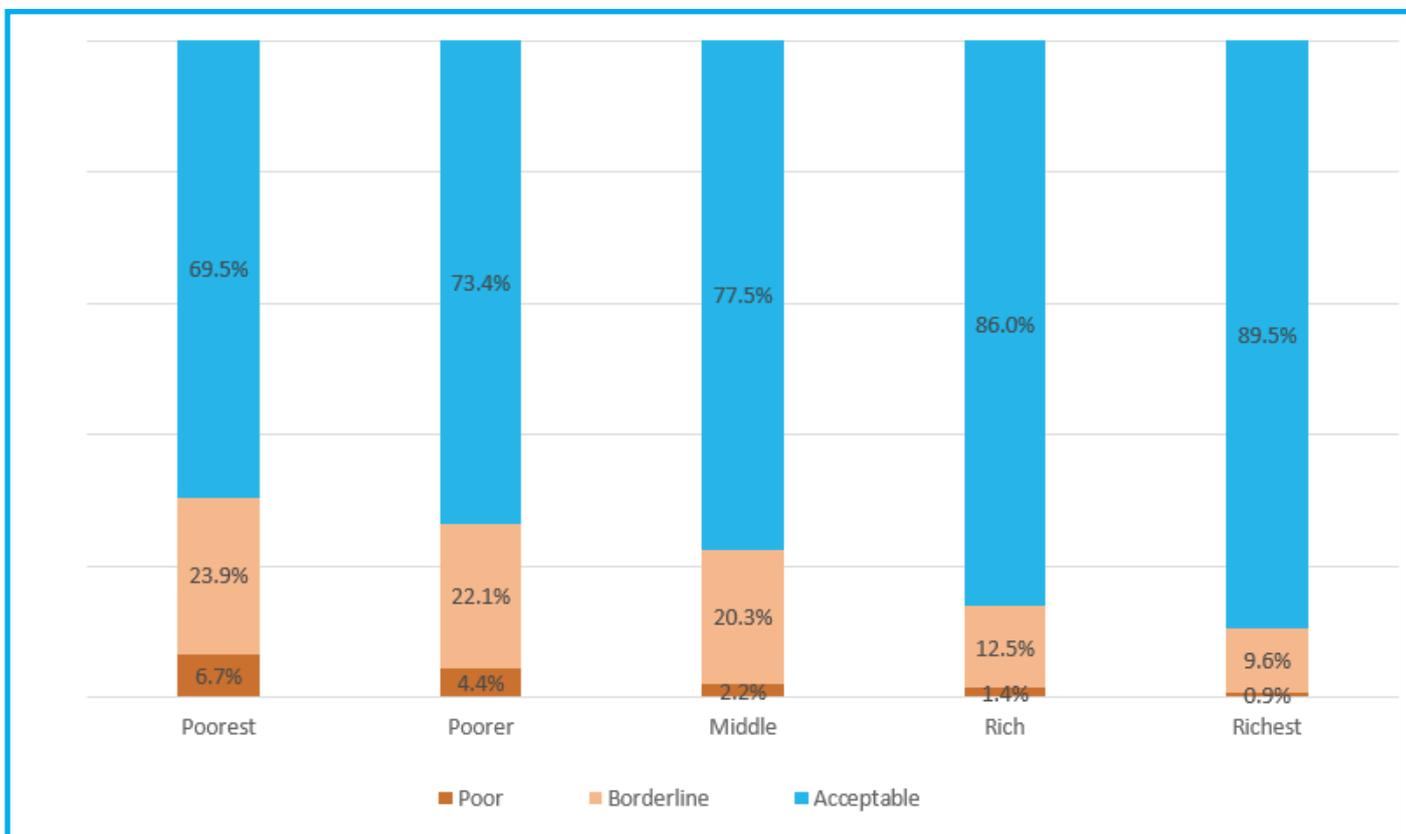
Source: Computed from WMS 2016

Food Access and Sources of Food

Food source is a proxy indictor to measure household food access. It also indicates whether the households are vulnerable to shocks or not based on the sources of food they depend on as a major source of food. For example, the rate of dependency on purchased food vs home produced indicates the extent to which households are vulnerable to high food prices. Households were asked about their major source of food during the seven days prior to the date of interview and nationally, 71 percent of food sourced from purchase, 25 percent own production, 2 percent food assistance, and 2 percent from gift relatives and friends during the seven days prior to the date of interview, respectively (Figure 4.13).

Own production   Gift   Food Aid   Purchase
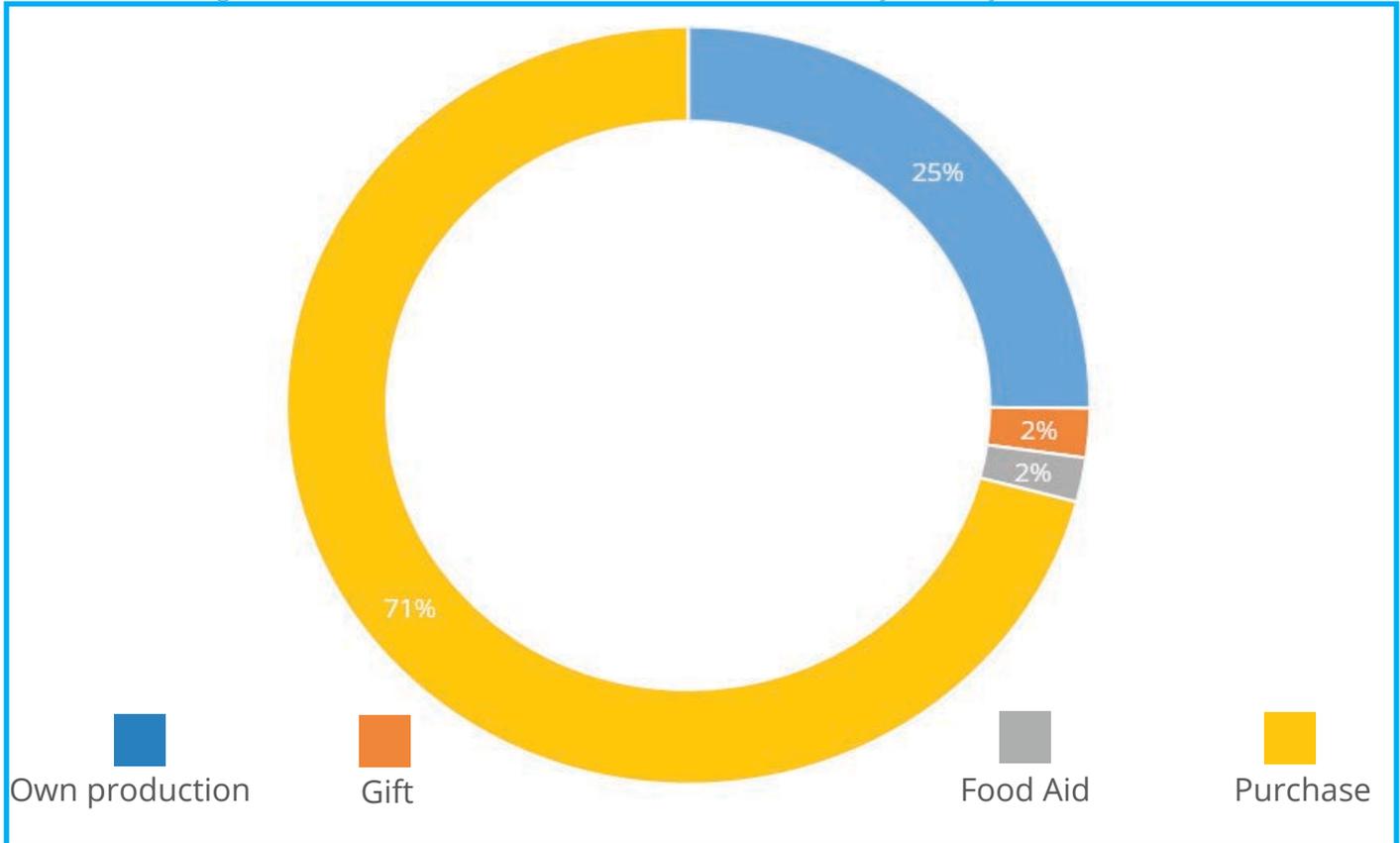
Source: Computed from WMS 2016

At national level, a high proportion (95 percent) of households interviewed in urban areas reported market purchase as a main source of food during the seven days prior to the date of interview (figure 4.14). In rural areas, approximately 32 percent of food sourced from own production during the seven days prior to the date of interview whereas only two percent sourced from own production of in urban areas.

By region, a relatively higher proportion of food had mainly sourced from own production in SNNPR as reported by interviewed households followed by Amhara and Oromia regions: on average own production contribute 35 percent household's food in SNNPR and , 26 percent each in Amhara and during the seven days prior to the date of interview (Figure 4.14). In Addis Ababa, all the interviewed households had reported that market was the main source of food. i.e, all food consumed during the seven days prior to the date of interview were sourced from purchase. Nearly three percent of food sourced from purchase in Harari and Dire Dawa as reported by the interviewed households. This could be due to Dire Dawa and Harari have few percent of rural population that mixed agriculture is their major livelihood. In Gambella, 3 percent of food had reportedly sourced from fishing and hunting. Own production was reported as the second

largest sources of food by all interviewed households except for households interviewed in Addis Ababa who reported purchase as a sole source of food during the seven days prior to the date of interview. The percentage of food reported as mainly sourced from food aid during the seven days prior to the date of interview was relatively high in Somali region (7 percent) and Tigray region (5 percent), Figure 4.14.

Overall, the proportion of food sourced from food aid as the main source of food during the seven days prior to the date of interview was the lowest as compared to own production and purchase sources, but it was still the third largest sources of food in three regions (7 percent in Somali, 5 percent in Tigray, and 3 percent in Amhara). In Amhara, food aid and food gift combined were reported as the main sources of food for six percent (3 percent each) of households during the seven days prior to the date of interview.

In general, purchase was a main source of food for the interviewed households during the seven days prior to the date of interview. This show that majority of the interviewed households were likely vulnerable to increase in food price during the seven days prior to the date of interview.

Figure 4.14: Household source of food by region and Rural and Urban
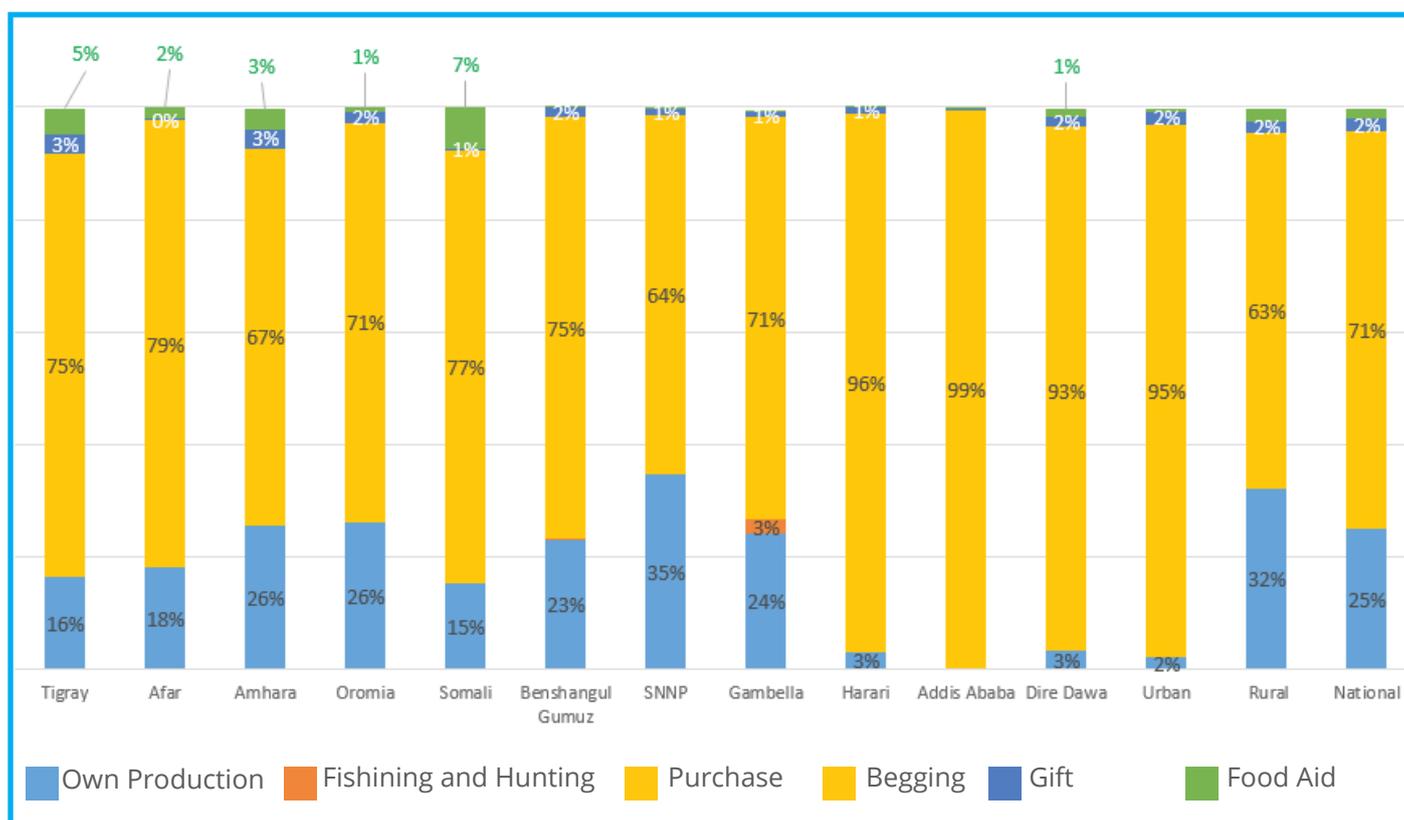
Source: Computed from WMS 2016

Consolidated Approach for Reporting on Food Security Indicators (CARI)

A Consolidated Approach for Reporting on Food Security Indicators (CARI) is a methodology of food security classification that combines three food security indicators out of five[47] in order to classify households across the four food security classification groups (Table 4.16).

In addition to providing the population's distribution across the four food security classification groups, the CARI console also generates an answer to the question: what percentage of the population are food insecure? and indicates the prevalence of food insecurity. The classification into food secure and food insecure households was calculated by combining the food secure and marginally food secure households into food secure and moderately food insecure and severely food insecure into food insecure (Table 4.15).

Table 4.15: Description of Food Security Classification Groups

Food Security Index	Description	Food secure/ Food insecure
Food secure	Able to meet essential food and non-food needs without engaging in atypical coping strategies	Food secure
Marginally food secure	Has minimally adequate food consumption without engaging in irreversible coping strategies; unable to afford some essential non-food expenditures	
Moderately food insecure	Has significant food consumption gaps, OR marginally able to meet minimum food needs only with irreversible coping strategies	Food insecure
Severely food insecure	Has extreme food consumption gaps, OR has extreme loss of livelihood assets will lead to food consumption gaps, or worse	

For this study; food energy deficiency, poverty status and livelihood coping strategy indictors are used for classification of households into different food security status (Table 4.16). To calculate the overall prevalence of 'food insecurity' in the population, simply sum together the rates of the two most severe categories ('moderately food insecure' and 'severely food insecure').

Table 4.16: CARI food security console, summary table of indicators

Domain	Indicator	Food Secure	Marginally Food Secure	Moderately Food insecure	Severely food insecure
Current Status	Food Energy deficiency[48]	66.2%	7.8%	7.5%	18.4%
		kcal/p/d > 2100	kcal/p/d < 2100 kcal/p/d ≥ mean (MDER[49], 2100)	kcal/p/d < mean (MDER, 2100), kcal/p/d ≥ MDER	kcal/p/d < MDER
Coping Capacity	Poverty status[50]	82%		15%	3%
		per adult equivalent expenditure > poverty line		100% food poverty line > per adult equivalent expenditure < 100% of poverty line	per adult equivalent expenditure < 100% of food poverty line
	Livelihood Coping Strategies	96.1%	1.5%	0.40%	1.9%
		(no coping)	(stress)	(crisis)	(emergency)
	Food Security Index	60.4%	19.1%	19.8%	0.7%

Source: Computed from WMS 2016

Final prevalence of food insecurity nationally showed that nearly 79.5 percent of households were food secure and 20.5 percent food insecure during the survey period. Table 3.18 summarizes the CARI console for Ethiopia based on 2016 WMS. Out of the 79.5 percent food secure households, 19.1 percent were marginally food secured.

Almost all food-insecure households (19.8 percent) are moderately food insecure during the survey period. At individual level51, the proportion of food insecure persons stood at 25.5 percent. This may mean that out of the total estimated population size of 102.4 million in the year, approximately 26 million people were experiencing household food insecurity. In April 2016, more than 10.2 million people were targeted with life-saving food assistance, while an additional 7.9 million people were targeted through the Productive Safety Net Programme (PSNP)52.

The number of food insecure in the country could have been much higher had food assistance not been in place to support the most vulnerable. The proportion of households that reported practicing livelihood coping strategies during 30 days prior to the date of interview is relatively low, possibly implying the cushion by these interventions.

Regional comparison indicates that a relatively higher proportion of households in Amhara (36.1 percent), Afar (26.1 percent) and Tigray (24.7 percent) regions are food insecure in order of importance. The two-consecutive drought in 2015 and 2016 that hit the country hardest during the survey period could be a contributing factor for a relatively high proportion of food insecure households.

Table 4.17: Percentage of households by food security status and region

Region	Food Secure	Food Insecure
Tigray	75.3	24.7
Afar	73.9	26.1
Amhara	63.9	36.1
Oromia	83.1	16.9
Somali	84.9	15.1
Benshangul Gumuz	79.4	20.6
SNNP	91.7	8.3
Gambella	91.6	8.4
Harari	90.7	9.3
Addis Ababa	88.5	11.5
Dire Dawa	93.1	6.9
Urban	86.1	13.9
Rural	77.3	22.7
National	79.5	20.5

Source: Computed from WMS and HCES 2016

The hotspot analysis of food insecurity as measured by CARI are presented in Figure 4.15. Statistically significant clustering of food insecurity is observed in the northern and southern parts of Somali region and Eastern, and Southern Oromia. Some parts of SNNPR, South Western Amhara, Western Oromia Oromia, and Eastern Benesahngul-Gumuz also have statistically significant clusters of food insecure households. On the other hand, major clusters of food security as measured by CARI is observed in central and western Ethiopia, most of the major urban centers.

Comparison by area of residence show a relatively high proportion of rural households are food insecure as compared to urban households (Table 4.17). Poorer households are more food insecure than non-poor households. This could be an indication that poverty is one of the root causes of vulnerability to food insecurity (detailed under Profile Section). The high proportion of food insecure households in urban area (nearly 14 percent) show that food insecurity is not only a rural phenomenon but also urban with an increase in urban unemployment.

Figure 4.15: Spatial Clustering of food security according to CARI approach
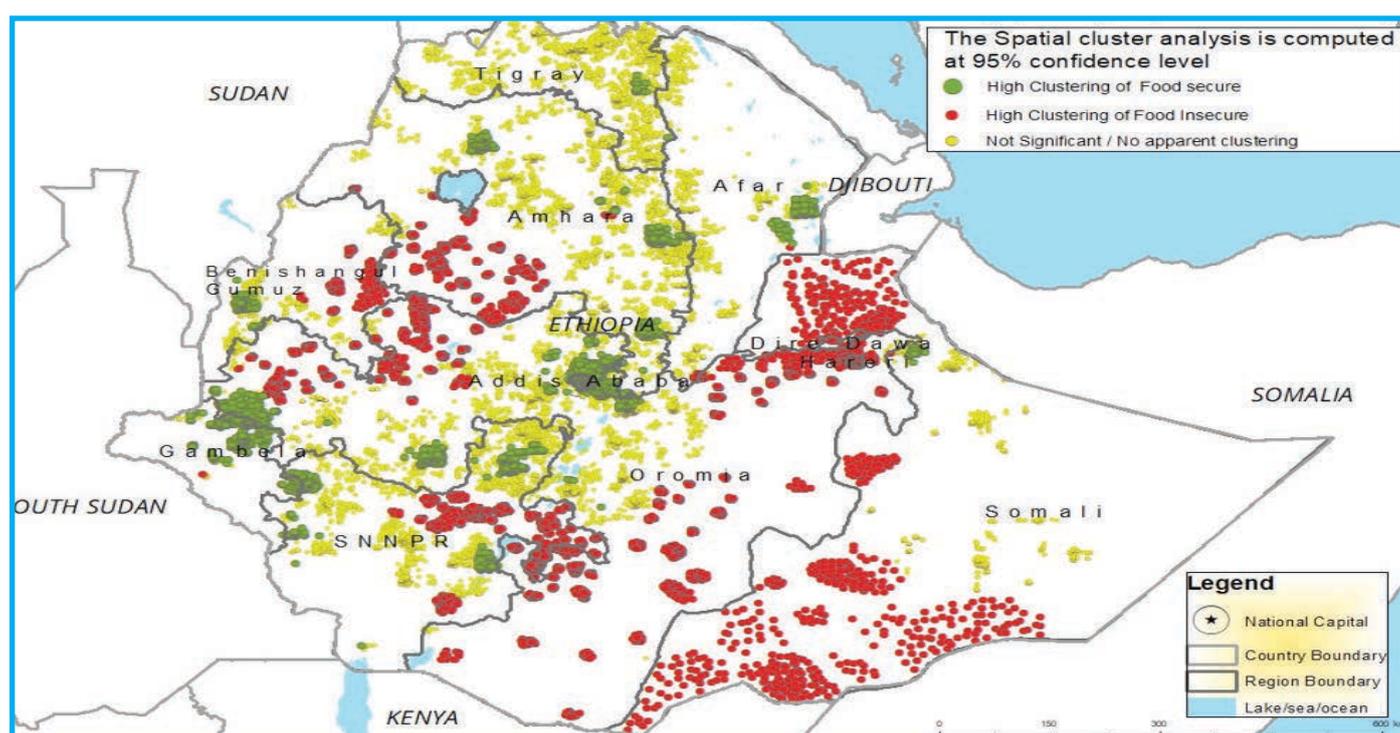
Source: Constructed based on 2016 WMS

[33]We applied the Dercon and Krishnan (1998) adult equivalent scale to calculate adult equivalent family size which was also applied by MOFED 2008 to set the poverty profile of Ethiopia.

[34]According to the 2015/16 HCES, average household size was 4.6 while adult equivalent family size was 3.8.

[35]UNU, WHO, and FAO. (2004). Human energy requirements: Report of a joint FAO/WHO/UNU expert consultation, Rome, October 17–24, 2001. FAO Food and Nutrition Technical Report Series 1.
Smith, L.A. (2007). Measuring Food Security. Using Household Budget Surveys. Washington, D.C.: International Food Policy Research Institute.

[36]For regional level disaggregated data in this section, refer to Annex 1.1 and 1.2

[37]Wood-Sichra, Ulrike. 2014. Cereal crops. In Atlas of African agriculture research and development: Revealing agriculture's place in Africa. Sebastian, Kate, Ed. Pp. 20-21. Washington, D.C.: International Food Policy Research Institute (IFPRI).

[38]Annuciate Nakiganda, Ahmed Mohamed, Stephen Ojangole and Robert Kaukha (2017) Price incentives to milk producers: a case of Uganda. Livestock Research for Rural Development 29 (4) 2017

[39]http://www.kenyamarkets.org/current-sectors/dairy/ accessed on December 12, 2018

[40]http://www.fao.org/dairy-production-products/products/milk-composition/en/ accessed on December 12, 2018

[41]OECD (2018), Meat consumption (indicator). doi: 10.1787/fa290fd0-en (Accessed on 03 October 2018)

[42]FAOSTAT, 2011.

[43]World Health Organization. Healthy Diet. Fact Sheet No 0394. Updated in September 2015 Available at: http://www.who.int/mediacentre/factsheets/fs394/en/

[44]FAO. 2015. Analysis of price incentives for Sorghum in Ethiopia. Technical notes series, MAFAP, by Assefa B. Lanos B., Rome.

[45]FCS was calculated by following the procedures stated in WFP (2008). Food consumption analysis Calculation and use of the food consumption score in food security analysis. Technical Guidance Sheet available at: https://documents.wfp.org/stellent/groups/public/documents/manual_guide_proced/wfp197216.pdf

[46]Hot spot analysis works by looking at each feature within the context of neighboring features. A feature with a high value is interesting but may not be a statistically significant hot spot. To be a statistically significant hot spot, a feature will have a high value and be surrounded by other features with high values as well. The local sum for a feature and its neighbors is compared proportionally to the sum of all features; when the local sum is very different from the expected local sum, and when that difference is too large to be the result of random chance, a statistically significant result is attained with user defined confidence level.

[47]Food consumption score (current status), food energy shortfalls (food quantity), food expenditure share, poverty status and livelihood coping strategies.

[48](1) Households with a per capita daily kilocalorie (Kcal) intake greater than 2,100 calories; (2) Households with a per capita daily Kcal intake which is less than 2,100 calories but greater than the mean of the national MDER and 2,100; (3) Households with a per capita daily Kcal intake which is greater than the national MDER but less than the mean of the MDER and 2,100; (4) Households with a per capita daily Kcal intake which is less than the national MDER.

[49]Minimum Dietary Energy Requirement (MDER) for Ethiopia is 1752. http://www.fao.org/fileadmin/templates/ess/foodsecurity/Food_Security_Indicators.xlsx, Sep 15, 2017, FAO - FOOD SECURITY INDICATORS
[50](1) Households with total per adult equivalent expenditure greater than the national poverty line; (3) Households with a per adult equivalent expenditure which is greater than the per adult national food poverty line but less than the national poverty line; (4) Households with a per adult equivalent expenditure which is less than the national per adult food poverty line.

[51]There are differences in the prevalence of food security when presenting at household and individual levels. This difference is primarily the function of differences in the household size between food secure and food insecure households. For example, the average household size of food secure households stands at X while it was X for food insecure households. However, it should be noted that the prevalence at individual level did not take into account the intra-household differences in terms of food insecurity.

[52]OCHA (2017). Ethiopian Humanitarian Fund 2016 Annual Report

5

Profile of the Food Insecure

One is considered as food secure when he / she has access at all times to enough food for an active, healthy life. Accordingly, a person is considered food secure when their consumption of food is sufficient, secure (not vulnerable to consumption shortfalls), and sustainable.[53] A range of factors can cause food insecurity including: political instability, war and civil strife, macroeconomic imbalances and trade dislocations to environmental   degradation, poverty, population growth, gender inequality, inadequate education, and poor health.

Four measures of food insecurity are utilized in this section, namely: Food Poverty, Food Energy Consumption (FEC), Food Consumption Score (FCS), and Consolidated Approach for Reporting on Food Security Indicators (CARI) to explore their association with various socio-demographic, economic and geographic factors. These indicators capture different aspects of food insecurity depending on their construct and thresholds. For example, according to the food poverty indicator, households falling below the national food poverty line are considered food poor, while those above the line are food non-poor. Using the FEC, food energy deficiency is set based on 2,550 Kcal per adult equivalent cut-off point. Households that have daily calorie consumption below 2,550 PAE are considered as having inadequate food energy consumption. Whereas using the FCS classification, households that have "poor" and "borderline" consumption are categorized as "inadequate". Using CARI, households that are identified as moderately and severely food insecure are considered as food insecure while households categorized as "food secure" and "marginally food secure" are merged to create "food secure" category.

This chapter highlights the most prominent factors that are associated with households' food insecurity. This section does not attempt to address the multiple underlying causes of food insecurity but rather to expand on the associations between selected variables and food insecurity within the context of the food security and conceptual framework.

Demographic Profile of the Food Insecure

The relationship between demographic characteristics of the head of household and food insecurity is complex. Households headed by women are better-off in terms of food security as measured by food poverty, FEC, and CARI. As depicted in Table 5.1, 20.9 percent of male headed households are food poor while their female headed counterparts are around 14.8 percent.[54] The level of food insecurity as proxied by FEC and CARI also consistently showed that female headed households are better off as compared to male headed households. This may be in part explained by the smaller average household size among female headed house-holds compared to male-headed households (3.4 vs 5.1), which leaves them with higher land-holding per adult equivalent particularly in rural settings.[55]

The age of the head of household is grouped into three categories: under-25 (young), 25 to 59 (prime ages), and 60 and above (old age). Food poverty is significantly lower among the young age group (7.9 percent) but sharply increases in the prime age group (20.5 percent) followed by a slight decrease in the old age category (18.8 percent). FEC and CARI reveal similar pattern to food poverty. The food insecurity, as measured by FCS, is slightly higher in the old age category as compared to households headed by adults in the prime age.

With regard to marital status, households headed by never married tend to fare better than households headed by married, which have the highest level of food insecurity and poverty followed by divorced. This pattern holds according to the food poverty, FEC, and CARI measures. As presented in Table 5.1, only 6.7 percent of the households in this category are deemed food 'poor'. The proportions of food poor households headed by married, divorced, separated and widowed/widowers comprised 21.1 percent, 25.3 percent, 28.8 percent, and 28.4 percent, respectively. Food energy deficiency was observed among 15.5 percent of never married and 32.9 percent of married categories. According to the CARI approach, households headed by never married constituted the largest proportion of food secure while households headed by married persons comprise the least proportion of food secure.

The other important demographic variable that tend to have influence on the food security and living standard of households is household size. The data presented in Table 5.1 shows that households in food poor category increase as household size increases. For example, over 97 percent of households with only one member are not deemed food poor while 63.4 percent of

households with more than 7 members were not considered food poor. The FEC and CARI approach also reveal that household food insecurity is positively correlated with an increase in household size. However, household size does not seem to have clear pattern on food security status as measured by FCS.

Literacy and education level of the head of household can influence on the way that the household relates to the labour market. A higher proportion of households headed by persons that can read and write were found to be better-off, in terms of food poverty and food security, as compared to those with heads of household who are illiterate. As measured by FCS, 17.8 percent

of the households headed by a person who was illiterate are deemed food inadequate as compared with 26.9 percent households headed by a person who can read and write. Using CARI, the level of food insecurity among literate headed households and illiterate headed households is significantly different (16.7 percent vs. 23.3 percent). There is an inverse relationship between the level of education attained by the head household and the likelihood of falling into food insecurity. This is consistent across all four of the household food security indicators. Accordingly, the highest level of food insecurity is concentrated around those households headed by men and women that do not have formal education.

Table 5.1: Food security status of households by demographic and education characteristics

Independent Variables	Food poverty		Food Energy Consumption (FEC)		Food Consumption Score (FCS)		CARI	
	Non-Poor	Poor	Adequate FEC	Inadequate FEC	Adequate	Inadequate	Food Secure	Food Insecure
Sex of the household head								
Male	79.1	20.9	67.0	33.0	78.4	21.6	77.8	22.2
Female	85.2	14.8	75.6	24.4	74.1	25.9	83.8	16.2
Age of the household Head								
under 25	92.1	7.9	84.3	15.7	79.2	20.8	93.8	8.6
25-59	79.5	20.5	68.0	32.0	77.9	22.1	78.4	21.6
60 and above	81.2	18.8	68.7	31.3	74.1	25.9	80.3	19.7
Marital Status of the household head								
Never Married	93.3	6.7	84.5	15.5	80.7	19.3	93.8	6.2
Married	78.9	21.1	67.1	32.9	78.3	21.7	77.7	22.3
Divorced	84.0	16.0	68.6	31.4	74.7	25.3	80.6	19.4
Separated	88.6	11.4	79.6	20.4	71.2	28.8	88.6	11.4
Widow	82.9	17.1	73.8	26.2	71.6	28.4	83.7	16.3
Household Size								
1	97.1	2.9	89.2	10.8	77.1	22.9	94.7	5.3
2	94.1	5.9	85.0	15.0	76.7	23.3	92.3	7.7
3	89.3	10.7	79.7	20.3	76.6	23.4	87.4	12.6
4	85.5	14.5	71.8	28.2	76.7	23.3	82.7	17.3
5	78.2	21.8	64.5	35.5	77.3	22.7	76.9	23.1
6	72.3	27.7	59.0	41.0	78.2	21.8	72.5	27.5
7 and above	63.4	36.6	52.9	47.1	78.1	21.9	65	35.0
Read and write								
Yes	85.9	14.1	73.0	27.0	82.2	17.8	83.3	16.7
No	76.3	23.7	66.1	33.9	73.1	26.9	76.7	23.3
Highest level of education attained								
No formal education	75.8	24.2	63.7	36.3	74.5	25.5	75.1	24.9
First Cycle Primary school	80.5	19.5	69.7	30.3	75.7	24.3	79.7	20.3

Source: Computed from 2016 WMS and HCES

Second Cycle primary school	86.1	13.9	75.5	24.5	78.9	21.1	84.2	15.8
Secondary school	90.9	9.1	81.4	18.6	84.2	15.8	90.4	9.6
Post-secondary school	96.5	3.5	85.7	14.3	91.6	8.4	94	6.0

Poverty and Food Insecurity

Food insecurity is usually related to poverty since chronic food insecurity is caused by the inability of households to produce, purchase or to have access to food. As displayed in Table 5.2, there is significant difference between the poor and the non-poor in terms of household food insecurity. While 93 percent of the non-poor households are found to be food non-poor, the corresponding value for the poor category is 24.9 percent. This means, 7 percent of the income non-poor and 75 percent of the income poor households were unable to meet the cost of buying the amount of calories sufficient to meet recommended daily calorie requirements. Poor households are also over represented in the food insecure category compared to the non-poor households in both FCS and CARI food security measures. The difference between the poor and the non-poor is statistically significant across all measures (P<0.001); which suggests that poverty is an important determinant of food insecurity at household level as poor households often lack the resources required to access enough nutritious food to live a healthy active life. Poor households are unable to invest in the inputs required to boost their own yields. Poor farmers may be forced to sell any surplus soon after harvest to earn income and repay debts, exposing themselves to fluctuating market prices as they may be able to benefit from selling when prices rise. The extreme poor have no financial buffer to protect them from shocks, such as crop failure/poor harvest, reduced income of households, and loss of employment. Stressed households often resort to negative coping mechanism, which in turn deplete their assets perpetuating the circle of food insecurity and poverty.

Apart from income, poverty can be measured using wealth index of the household. The results, presented in Table 5.2, suggest that the proportion of food poor increases as households move from the poorest quintile (Q1) to the richest quintile (Q5). Among households in the Q1, the proportion of food insecure households was around 27 percent while the proportion of food poor decreases to 9.4 percent among households in Q5. The proportion of food in-secure households, as measured by FCS, also decreases from 30.5 percent in Q1 to 10.5 percent in Q5. Using CARI, households deemed food insecure range between 31.5 percent in Q1 to 14.7 percent among households in Q5. This suggests that a household's asset and wealth are significantly association with their food security status. Households that have better asset and wealth have a higher likelihood of becoming food secure as compared to households with lower assets and wealth.

Table 5.2: Food security status of households by poverty status

Independent Variables	Food Poverty		Food Energy Consumption (FEC)		Food Consumption Score (FCS)		CARI	
	Food Non-Poor	Food Poor	Adequate FEC	Inadequate FEC	Adequate	Inadequate	Food Secure	Food Insecure
Absolute Poverty								
Non-Poor	93	7	78.2	21.8	79.2	20.8	89.1	10.9
Poor	24.9	75.1	28.9	71.1	68.4	31.6	36.7	63.3
Wealth Index Quintiles								
Poorest (Q1)	73.0	27.0	60.4	39.6	69.5	30.5	68.5	31.5
Poorer (Q2)	77.7	22.3	63.4	36.6	73.4	26.6	74.1	25.9
Middle (Q3)	78.3	21.7	60.9	39.1	77.5	22.5	74.1	25.9
Rich (Q4)	81.7	18.3	66.5	33.5	86	14	80.2	19.8
Richest (Q 5)	90.6	9.4	75.9	24.1	89.5	10.5	85.3	14.7

Source: Computed from 2016 WMS and HCES

Livelihood and Food insecurity

Households perform various activities to gain and maintain their livelihoods. Crop production is the biggest employer comprising 48.1 percent of the households, followed by a mix of livestock and crop production (16 percent), salaried jobs (10.5 percent), trade (including formal and informal wholesale and retail) and service sectors (8.3 percent), casual labour (4.3 percent), and livestock rearing (3.6 percent). Livelihood sources such as renting house, remittance, and manufacturing and construction constitute 2.8 percent, 2.7 percent, and 1.5 percent of the households, respectively. Table 5.3 presents the food security status of households dependent on different livelihood activities.

Households that earn their living from agricultural activities (crop and livestock) have relatively high proportion of food poor households. Households that engage in a mix of crop and livestock production have the highest proportion of food poor households (26.5 percent), followed by those engaged in livestock rearing (25 percent). The other sectors that have a higher proportion of food poor households include the informal manufacturing, construction, mining and quarry industry (22.2 percent), crop production (21.2 percent), and casual labour (20.1

percent). The CARI measurement suggests that food insecurity is relatively high among households engaged in informal manufacturing, construction and mining sector (27.7 percent), mixed agriculture (27.1 percent), and casual labour (25.1 percent).

On the other hand, households engaging in formal trade (including wholesale, retail and service), service trade (formal), and salary paying jobs are more food secure as measured by food poverty, FCS, and CARI. Only 5.9 percent of households engaged in formal sector of service trade fall below the food poverty line. The proportion of food poor is also relatively low among households that are dependent on salaried jobs (7.1 percent) and formal wholesale and retail trade (8.5 percent). Relative high concentration of food insecurity, as measured by FCS, are observed among households engaged in casual labour (30.9 percent), informal trade in service sector (29.2 percent), and crop production (27.6 percent). Contrary to the results of food poverty, households engaged in livestock rearing and a mix of crop and livestock production have relatively lower proportion of food insecurity. This may be because these households have access and consume quality foods, such as milk, which increase the FCS. As gauged by CARI, the level of food insecurity is relatively low among households' dependent on remittance (9.7 percent), formal sector of service trade (10.1), and salaried jobs (10.3).

Table 5.3: Food security status of households by livelihood type

Livelihood/Main source of income	Food Poverty		Food Energy Consumption (FEC)		Food Consumption Score (FCS)		CARI	
	Food Non-Poor	Food Poor	Adequate FEC	Inadequate FEC	Adequate	Inadequate	Food secure	Food insecure
Salary	92.9	7.1	80.3	19.7	88.7	11.3	89.7	10.3
Causal labour/Daily labourer	79.9	20.1	66.3	33.7	69.1	30.9	74.9	25.1
Crop production	78.8	21.2	67.9	32.1	72.4	27.6	79.6	20.4
Livestock (including Poultry and Bee)	75.0	25.0	72.5	27.5	83.3	16.7	77.2	22.8
Crop and Livestock (at comparable level)	73.5	26.5	61.8	38.2	82.4	17.6	72.9	27.1
Manufacturing, Construction, Mining & Quarry Industry (Formal)	90.7	9.3	70.2	29.8	83.9	16.1	77.7	22.3
Manufacturing, Construction, Mining & Quarry Industry (Informal)	77.8	22.2	62.2	37.8	75.6	24.4	72.3	27.7
Whole sale & Retail Trade - Formal Sector	91.5	8.5	76.6	23.4	88.4	11.6	86.4	13.6
Whole sale & Retail Trade - Informal Sector	86.6	13.4	78	22	78.6	21.4	83.7	16.3
Service Trade - Formal Sector	94.1	5.9	78	22	92.1	7.9	89.9	10.1
Service Trade - Informal Sector	90.0	10.0	75.8	24.2	70.8	29.2	82.5	17.5
Renting of House, Land plot, Equipment, Machinery, Storage	81.7	18.3	59	41	80.3	19.7	71.1	28.9
Remittance (Regularly received)	89.3	10.7	82.2	17.8	79.3	20.7	90.3	9.7

Source: Computed from 2016 WMS and HCES

Access to Services and Food security

Multiple pathways link roads to food security including agricultural performance, food availability, food prices, and incomes.[56] There is a transaction cost for producing and selling surplus food in markets, which may be affected by transportation cost[57] and availability of the necessary infrastructure. This in turn can impact the amount of income that the household generates from its agricultural activities. As displayed in Table 5.4, three access to services indicators are used to explore their association with food security. These indicators are distance from dry weather road, distance from food market, and distance from cross-country public transport services. The further away a household is located from dry

weather road, food markets, or cross-country public transport, the more likely it is food insecure as measured by food poverty and and CARI. Across all measures of food security status, households within 5 km radius from dry weather road, food markets, and cross-country public transport have the lowest proportion of food insecurity.

Table 5.4: Food security status of households by access to services

	Food Poverty		Food Consumption (FEC)		Energy Food Score (FCS)	Consumption	CARI	
	Food Non-Poor	Food Poor	Adequate FEC	Inadequate FEC	Adequate	Inadequate	Food secure	Food insecure
Distance from dry Weather road								
0 to 5 Km	83.0	17.0	72.1	27.9	79.6	20.4	82.2	17.8
5.1 to 10 Km	74.8	25.2	59.2	40.8	70.8	29.2	71.6	28.4
10.1 to 15 km	74.4	25.6	64.4	35.6	67.0	33.0	74.2	25.8
< 15 km	68.8	31.2	58.7	41.3	71.5	28.5	68.8	31.2
Distance from Food market								
0 to 5 Km	83.7	16.3	72.1	27.9	78.0	22	82.3	17.7
5.1 to 10 Km	77.9	22.1	65.8	34.2	75.4	24.6	76.7	23.3
10.1 to 15 km	77.2	22.8	66.9	33.1	79.4	20.6	77.5	22.5
< 15 km	72.9	27.1	62.0	38.0	73.7	26.3	72	28
Distance from Cross-country Public transport service								
0 to 5 Km	88.1	11.9	75.0	25.0	82.4	17.6	85.4	14.6
5.1 to 10 Km	81.2	18.8	72.1	27.9	73	27	81.6	18.4
10.1 to 15 km	79.0	21.0	66.0	34.0	73.6	26.4	77.2	22.8
< 15 km	77.5	22.5	66.6	33.4	76.7	23.3	77.1	22.9

Source: Computed from 2016 WMS and HCES

Geography of the food insecure

There was wide variation in the geography of food insecurity based on the four measures. Food poverty is highest in Tigray (25.1 percent), followed by Amhara (24.7 percent), Afar (21.2 percent), and Somali (20.4 percent). Higher levels of food insecurity, as measured by FCS, was observed in SNNPR (46.1 percent) and Afar (30.6 percent). Using CARI, Amhara (36.1) has the highest level of food insecurity, followed by Afar (26.1), and Tigray (24.7 percent).

Table 5.5: Food security status of households by region

Region	Food Poverty		Food Energy Consumption (FEC)		Food Consumption Score (FCS)		CARI	
	Food non-poor	Food Poor	Adequate FEC	Inadequate FEC	Adequate	Inadequate	Food secure	Food insecure
Tigray	74.9	25.1	61.6	38.4	78.7	21.3	75.3	24.7
Afar	78.8	21.2	59	41	69.4	30.6	73.8	26.1
Amhara	75.3	24.7	45.3	54.7	85.2	14.8	63.9	36.1
Oromiya	84.4	15.6	76.7	23.3	82.3	17.7	83.1	16.9
Somali	79.6	20.4	84.7	15.3	80.2	19.8	84.9	15.2
Benshangul-Gumuz	82.7	17.3	68.3	31.7	85	15	79.4	20.6
SNNP	81	19	86.1	13.9	53.9	46.1	91.6	8.3
Gambella	88.9	11.1	88.2	11.8	82.2	17.8	91.6	8.4
Harari	95.7	4.3	63.3	36.7	89.8	10.2	90.7	9.3
Addis Ababa	87	13	73.3	26.7	83.4	16.6	88.4	11.5
Dire Dawa	92.3	7.7	91.8	8.2	84	16	93.1	6.9
National	80.7	19.3	69.3	30.7	77.3	22.7	79.5	20.5

Source: Computed from 2016 WMS and HCES

Agro-Ecological Zoning refers to the division of an area of land into smaller units, which have similar characteristics that are related to land suitability, potential production and environmental impact.[58] Food poverty is highest among households in highland agro-ecological zone (23.6 percent), followed by lowland (21.8 percent). Food insecurity, as measured by CARI and FEC, is relatively higher in the highland agro-ecological zone.

Table 5.6: Food security status of agro-ecology zone

Agro-ecology zone	Food Poverty		Food Energy Consumption (FEC)		Food Consumption Score (FCS)		CARI	
	Food non-Poor	Food Poor	Adequate FEC	Inadequate FEC	Adequate	Inadequate	Food secure	Food insecure
Highland	76.4	23.6	57.9	42.1	79.4	20.6	70.9	29.1
Temperate	82.6	17.4	69.9	30.1	76.5	23.5	80.9	19.1
Lowland	78.2	21.8	73.2	26.8	78.0	22.0	80.9	19.1

Source: Computed from 2016 WMS and HCES

Parameter Estimation of Logistic Regression

Logistic regression model is estimated to analyze the determinants of food insecurity in Ethiopia using. The key variables included to model the probability of falling into food insecurity are sex of the household head (male versus female), age of the household head (continuous), household size (continuous), marital status of the household head (categorical), place of residence (urban vs Rural), quintile of the household wealth index, distance from food market (continuous), cross-country transport (continuous), distance from dry weather road (continuous), livelihood (crop agriculture, livestock rearing, mixed agriculture, and engagement in informal sectors, and literacy (able to read and write or not) as potential determinants of food insecurity.

The age of the household head is a significant demographic correlate of food insecurity. The higher the age of the household head the higher the likelihood of the household being food insecure as estimated by food poverty (P<0.001) and FCS (P<0.05) approaches in adjusted analyses. This pattern may be because younger couples can both work and sometimes there may be wedding gifts to enhance their living standard. However, they may fall into poverty and food insecurity as small children join the household, limiting per person income as the primary

caregiver reduces or forgoes their income to take care of the children. The concentration of poverty and food insecurity in the prime ages mean that small children in households may suffer the direct and in some cases irreversible health and nutrition impacts.

Sex of the household head is not a significant predictor of food insecurity as measured by food poverty and CARI. Compared to female-headed households, male-headed households have 1.15 times more likelihood of being insecure as measured by FCS (P<0.05). On the other hand, being male-headed household decreased the odds of being food energy deficiency by a factor of 0.667 (95% C.I: 0.604-0.737) as compared to female headed households. Controlling for socioeconomic and demographic variables, household size increased the odds of falling into food poverty/ food insecurity by a factor of 1.379 (95% C.I: 1.352-1.407), 1.354 (95% C.I: 1.332-1.377), and 1.326 (95% C.I: 1.302-1.350) using food poverty, FED, and CARI approaches, respectively. This may mean that most of the household members are consumers rather than producers. Thus, the larger the household size the more the pressure on the household for the scarce resources available and thus the higher the likelihood of falling into food insecurity.

Table 5.7: Logistic regression analysis of Food insecurity as measured by Food Poverty, FED, FCS, and CARI approaches

Independent Variables	Food Poverty Adjusted Odds Ratio (95% C.I.)	Food Energy Deficiency (FED) (Adjusted Odds Ratio(95% ci0	Dietary Inadequacy-FCS Adjusted Odds Ratio (95% C.I.)	Food Insecurity-CARI Adjusted Odds Ratio (95% C.I.)
Age	1.009 (1.006-1.012) ***	0.950 (0.946-0.954)***	1.003 (1.000-1.005) *	1.001(0.998-1.004)
Male (Vs. Female)	0.982 (0.858-1.125)	0.667(0.604-0.737)***	1.152 (1.032- 1.285) *	0.920 (0.819-1.033)
Married (Reference)				
Never Married	1.511 (1.213-1.882) ***	0.517 (0.222-1.206)	1.203 (1.035-1.397) *	0.674 (0.554-0.819) ***
Divorced	1.666 (1.368-2.029) ***	0.338(0.146-0.785)**	1.079 (0.919-1.266)	1.471 (1.245-1.737) ***
Separated	1.220 (0.852-1.746)	0.584(0.250-1.363)	1.154 (0.885-1.504)	1.403 (1.065-1.846) *
Widowed/	1.186 (0.994-1.415) *	0.595 (0.250-1.419)	1.021(0.878-1.188)	1.121(0.960-1.309)
Urban (Vs. Rural)	0.819 (0.700-0.959) *	0.515 (0.221-1.201)	0.931 (0.806-1.076)	1.108 (0.960-1.279)
Household size	1.379 (1.352-1.407) ***	1.354 (1.332-1.377)***	0.973 (0.954-0.993) **	1.326 (1.302-1.350) ***
Unable to Read and Write (Vs. Able to read and write)	1.341 (1.243-1.448) ***	1.142 (1.070-1.220)***	1.085 (1.006-1.172) *	1.241 (1.157-1.332) ***
Crop agriculture (Vs. Others)	0.824 (0.712-0.953) **	0.940 (0.854-1.034)	0.841 (0.740-0.957) **	0.704 (0.618-0.803) ***
Livestock rearing (Vs. Others)	0.774 (0.619-0.969) *	0.435 (0.357-0.531)***	0.467(0.372-0.586) ***	0.468 (0.376-0.584) ***
Mixed agriculture (Vs. Others)	1.395 (1.178-1.651) ***	1.112 (0.978-1.264)	0.573 (0.483-0.680) ***	1.030 (0.881-1.203)
Informal sector livelihood (Vs. Others)	1.058 (0.906-1.234)	1.057 (0.950-1.178)	1.355 (1.197-1.534) ***	1.134 (1.002-1.284) *
Distance from dry season roads (KM)	1.002 (0.996-1.008)	1.132 (1.070-1.199)***	1.006 (1.000-1.012) *	1.007 (1.001-1.013) *
Distance from cross country public transport (KM)	1.001 (1.000-1.002) *	0.913 (0.888-0.938)****	0.995 (0.994-0.997) ***	0.998 (0.997-0.999) ***
Distance from Food Market (KM)	1.009 (1.002-1.016) *	0.953 (0.908-0.999)*	0.996 (0.989-1.003)	1.008 (1.001-1.015) *
Wealth Index Q1 (Reference)				
Wealth Index Q2	0.884 (0.761-1.028)	1.096 (0.959-1.253)	0.758 (0.659-0.872) ***	0.835(0.721-0.967) *
Wealth Index Q3	0.820 (0.702-0.959) *	1.046 (0.919-1.191)	0.631 (0.545-0.730) ***	0.812 (0.698-0.943) **
Wealth Index Q4	0.670 (0.572-0.786) ***	1.092 (0.961-1.241)	0.378 (0.324-0.441) ***	0.619 (0.531-0.722) ***
Wealth Index Q5	0.285 (0.237-0.343) ***	0.892 (0.798-0.997)*	0.165 (0.139-0.197) ***	0.570 (0.481-0.675) ***
Constant	0.040	0.792	0.723	0.050

Source: Computed from 2016 HCES and WMS
***P<0.001   ** P<0.01 * P<0.05

Literacy status of the household head is negatively related with household food insecurity as estimated by food poverty(P<0.001), FED (P<0.001), FCS (P<0.001), and CARI (P<0.001). It is an important determinant of household food security because an educated household is more sensitive to adopt technology to maximize the output they generated from farm activities in rural areas and better paying jobs in urban settings. The results showed that the urban households were 1.22[59] times less likely to become food poor compared to rural resident

households (P< 0.01). There is no statistically significant difference between Urban and rural households in terms of food insecurity as estimated by FCS FED, and CARI.

With regard to livelihood status, it was found that the households engaged in crop agriculture were 1.21 times less likely to be food poor compared to households in other livelihood categories (P<0.01). These households are also less likely to be food insecure as measured by FCS (by a factor of 1.19 P<0.01) and CARI (by a factor of

1.42, P<0.001). Households engaged in livestock rearing are also less likely to be food poor by a factor of 1.29 (P<0.05), food insecure as proxied by FED by a factor of 2.29 (P<0.001), FCS by a factor of 2.14 (P<0.001), and CARI by a factor of 2.14 (P<0.001) as compared to those households engaged in other livelihood types. On the other hand, households engaged in mixed agriculture (both crop and livestock) are more likely to be food insecure as estimated by FCS and CARI (P<0.05). Households making a living out of informal sector activities (including wholesale and retail trade, service trade, construction, manufacturing, mining) are more likely to be food insecure as measured by FCS by a factor of 1.355 (P<0.001) and CARI by a factor of 1.134 (P<0.05) compared to households in the other livelihood activities.

The probability for a household to be food secure tends to increase with an increase in the wealth index quintile. This means that the probability of falling into food insecurity decreases with an increase in the wealth index quintile as measured by food poverty, FCS, and CARI. Households that are in quintile 5 are 3.51 times less likely to be food poor as compared to those household in Q1 (P<0.001). As measured by FCS and CARI, the odds of falling into food insecurity is 6.06 times (P<0.001) and 1.75 times (P<0.001) lesser among households in quintile 5 as compared households in quintile 1, respectively. The result consistently revealed that ownership of assets is important in determining food security status of households in Ethiopia. On the other hand, wealth index is not an important determinant of food energy deficiency.

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[53]Simon Maxwell (1996). Food security: a post-modern perspective. Volume 21, Issue 2, May 1996, Pages 155-170

[54]The percentage of food poor reported in this section is referring to the food poverty level at household level. While the prevalence of food poverty was reported to be 24.8 percent, the percentage of households that are classified as food poor stood at 19.3 percent. Similarly, the prevalence of absolute poverty (head count index) was 23.5 percent while the percentage of poor households was 18.1 percent.

[55]Land is the ultimate source of almost all income in most rural areas of Ethiopia, progressive shortage and degradation of the land may put households at increased risk of food insecurity.

[56]WFP (2017). Road and market Access, and Household Food Security in Nepal.

[57]Bart Minten, Bethlehem Koro, and David Stifel (2013). The Last Mile(s) in Modern Input Distribution: Evidence from Northwestern Ethiopia Bart. IFPRI. ESSP WORKING PAPER 51

[58]FAO, (1996). Agro-Ecological Zoning Guidelines. FAO Soils Bulletin 73

[59]Computed as 1/0.819

6

Economic Vulnerability

The more widely used food security analysis methods mainly consider current access to food. Given that the access to adequate and sufficient food in developing countries like Ethiopia is unstable, measuring households' current condition to determine their state of food security may have its own limitations to capture the dynamic concept.[60] The economic vulnerability analysis in this section provides an insight into the probability that a given household will lose or gain access to sufficient food in the near future. The indicators used to measure economic vulnerability in this section include: poverty, wealth index, household total consumption expenditure, and share of household consumption expenditure on food.

Poverty

Absolute poverty is measured by comparing a household's consumption per adult equivalent to the national poverty line, set at 7,184 Birr in 2016. The poverty line indicates the minimum money required to afford the food covering the minimum required caloric intake and additional non-food items. The headcount index of absolute poverty decreased from 44.2 percent in 2000 to 23.5 percent in 2016 (a decrease of 46.8 percent).

Differences in level of absolute poverty were observed across regions (Table 6.1). In 2016, Tigray (27 percent), Beneshangul-Gumuz (26.5 percent), Amhara (26.1 percent), Oromia (23.9 percent), and Afar (23.6 percent) marked higher poverty headcount index than the figure at national level. The three dominantly urban administrative areas of Harari (7.1 percent), Dire Dawa (15.4 percent), and Addis Ababa (16.8 percent) registered the lowest level of poverty. Poverty incidence in rural Ethiopia (25.6 percent) was significantly higher than urban Ethiopia (14.8 percent).

Table 6.1: Trends of Prevalence of Absolute Poverty and Food Poverty by Region

| Region	Head Count of Absolute Poverty					Food Poverty				
	2000	2005	2011	2016	Percentage of Change (2000-2016)	2000	2005	2011	2016	Percentage of Change (2000-2016
Tigray	61.4	48.5	31.8	27.0	-56.0%	53.7	46.8	37	32.9	-38.7
Afar	56.0	36.6	36.1	23.6	-57.9%	53.4	39.2	32	28.3	-47.0
Amhara	41.8	40.1	30.5	26.1	-37.6%	32.5	38.8	43	31.3	-3.7
Oromia	39.9	37.0	28.7	23.9	-40.1%	38.0	36.9	33	20.5	-46.1
Somali	37.9	41.9	32.8	22.4	-40.9%	42.5	40.9	27	25.5	-40.0
Benishangul-Gumuz	54.0	44.5	28.9	26.5	-50.9%	55.2	44.4	35	23.7	-57.1
SNNPR	50.9	38.2	29.6	20.7	-59.3%	54.7	37.0	26	24.5	-55.2
Gambella	50.5		32.0	23.0	-54.5%	57.2	NA	26	17.2	-69.9
Harari	25.8	27.0	11.1	7.1	-72.5%	32.8	25.1	5	6.3	-80.8
Addis Ababa	36.1	32.5	28.1	16.8	-53.5%	47.5	32.4	26	19.1	-59.8
Dire Dawa	33.1	35.2	28.3	15.4	-53.5%	27.6	34.5	22	12.2	-55.8
Rural-Total	45.4	39.3	30.4	25.6	-43.6%	41.1	38.5	34.7	27.1	-34.1
Urban-Total	36.9	35.1	25.7	14.8	-59.9%	46.7	35.3	27.9	15.2	-67.5
National	**44.2**	**38.7**	**29.6**	**23.5**	**-46.8%**	**41.9**	**38.0**	**33.6**	**24.8**	-40.8

Source: Compiled and Computed from National Planning Commission and MOFED Poverty Reports

Between 2000 and 2016, Harari (72.5 percent), SNNPR (59.3 percent), Afar (57.9 percent), and Tigray (56 percent) experienced largest poverty reduction. On the other hand, Amhara (37.6 percent), Oromia (40.1 percent), and Somali (40.9 percent) exhibited a relatively sluggish pace during the same period. An accelerated pace of poverty reduction was also registered in urban Ethiopia (59.9 percent) as compared to rural Ethiopia (43.6 percent).

The food poverty line, which is estimated based on the cost of a bundle of food that gives a minimum daily caloric requirement (2200 Kcal), was set at 3772 Birr per year per adult person in 2016. One out of four individuals in Ethiopia is unable to meet the cost of buying the amount of calories sufficient to meet recommended daily calorie requirements. Food poverty is substantially higher in rural Ethiopia

(27.1 percent) as compared to that of urban Ethiopia (15.2 percent). Tigray, Afar and Amhara have the highest proportion of food poor. In most of the regions, the level of food poverty is slightly higher than the level of absolute poverty. This may suggest that much of the persistent poverty in Ethiopia is triggered by lack of sufficient food at household level. Between 2000 to 2016, food poverty marked 40.8 percent reduction at national level. Relatively faster pace of reduction of food poverty was observed in Harari (about 81 percent), Gambella (about 70 percent), Addis Ababa (59.8 percent), Ben-Gumuz (57.1 percent), Dire Dawa (55.8 percent) and SNNP 55.2 percent). Registering just 3.7 percent reduction in food poverty, Amhara region fared the least performance over the stated period. Figure 6.1 depicts that the prevalence of food poverty is spread across the country. While food non-poor clusters were observed in major city/town centers.

Figure 6.1: Spatial Clustering of Food Poverty
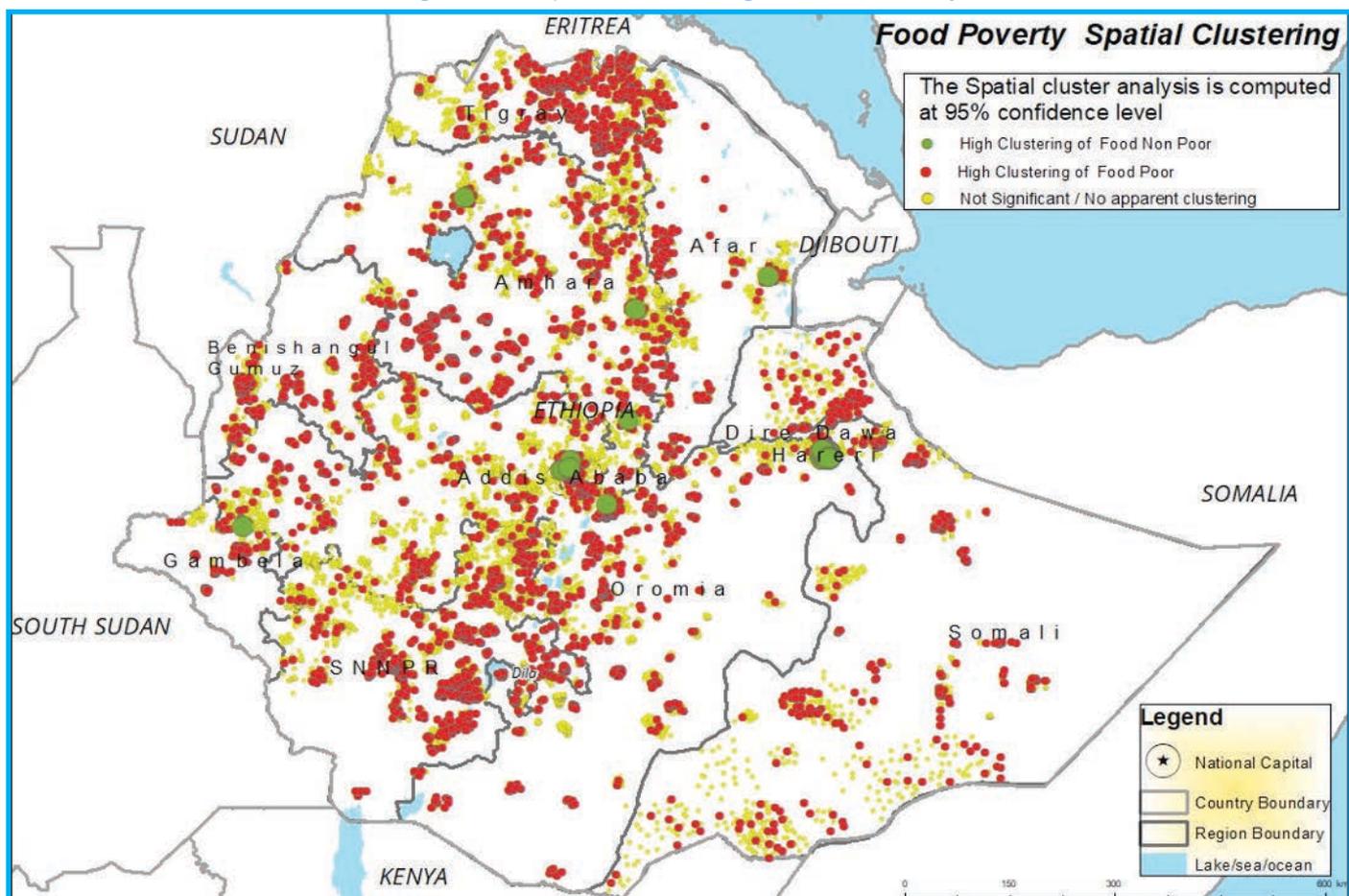
Source: Constructed based on 2016 HCES/WMS

Wealth index (WI)[61]

The 2016 Welfare Monitoring Survey (WMS) gathered information on a wide variety of assets, both productive and household assets. Individual asset ownership is used to describe households. WI is constructed from individual assets as an indicator of relative wealth. Household wealth gives an idea of ability to access food and economic vulnerability. In relation to food security, the WI is used to differentiate poorer households from the relatively wealthier ones. Households are ranked into quintiles, dividing the population into five equal groups. Data on assets and wealth is also very useful to triangulate income and expenditure information as accurate income and expenditure data is difficult to obtain from households.

In terms of methodology, what is calculated is a national WMS using a Principal Component Analysis (PCA). In other words, the calculation uses assets that are valid as proxies of wealth in both urban and rural areas. Assets that would bias the analysis to one area, such as productive assets including livestock are excluded. Selection of the final variables to construct the wealth index is an iterative process where the wealth quintiles are checked for validity and appropriateness.

Comparison by region shows that pastoralist and agro-pastoralist regions of Somali and Afar have the highest percentage of households in the poorest quintiles at 49 percent and 35 percent respectively, followed by SNNPR, 29 percent.

Figure 6.2: Percent of households falling into each wealth quintile by region
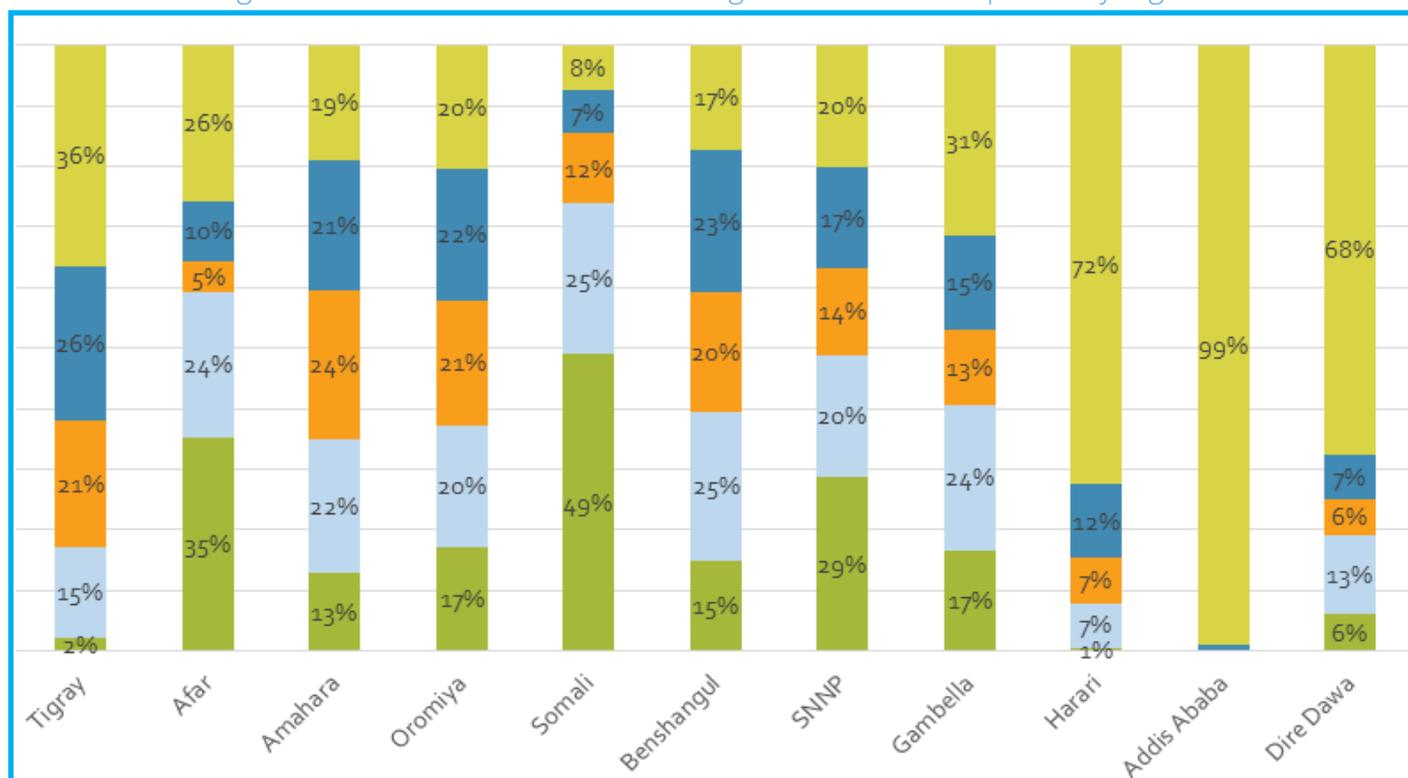
The regions with the lowest percentage of households in the poorest quintile are Dire Dawa, Tigray, Harari and Addis Ababa, 6 percent, 2 percent, 1 percent, and none, respectively. Nearly all the households in Addis Ababa fall under the richest quintile. In the other dominantly urban administrative areas of Dire Dawa and Harari, 72 and 68 percent of their households in the richest quintile.

Households in Afar and Somali became more asset poor as the percent of the poorest households in 2016 as compared to 2011. The proportion of the middle and rich households decreased in these two regions. The richest quintile increased in all regions except Somali.

Table 6.2: Percentage of households by their wealth index quintile group, region and year

Region	2011					2016				
	Poorest	Poorer	Middle	Rich	Richest	Poorest	Poorer	Middle	Rich	Richest
Tigray	8	20	24	25	24	2	15	21	26	36
Afar	25	22	15	15	23	35	24	5	10	26
Amhara	18	21	23	24	14	13	22	24	21	19
Oromia	20	19	21	23	18	17	20	21	22	20
Somali	26	29	23	12	10	49	25	12	7	8
Benishangul-Gumuz	12	22	26	27	13	15	25	20	23	17
SNNPR	31	25	18	13	14	29	20	14	17	20
Gambella	27	19	16	17	21	17	24	13	15	31
Harari	3	8	12	17	61	1	7	7	12	72
Addis Ababa	0	0	0	4	95	0	0	0	1	99
Dire Dawa	5	9	10	14	62	6	13	6	7	68

As the Table 6.3 shows, rural households are far poorer than urban households in terms of wealth as measured by assets.

Table 6.3: Percentage of households by wealth index quintile, area of residence, and region

|	RURAL					URBAN				
	Poorest	Poorer	Middle	Rich	Richest	Poorest	Poorer	Middle	Rich	Richest
Tigray	3.2	20.8	28.5	32.2	15.4	0.0	0.8	2.5	9.9	86.7
Afar	47.1	31.5	5.4	8.7	7.3	1.3	2.3	3.7	13.9	78.9
Amhara	16.2	27.3	29.6	22.2	4.7	0.3	1.8	4.4	18.5	75.1
Oromia	21.0	24.9	24.9	23.8	5.4	0.3	1.2	2.6	13.1	82.8
Somali	57.4	27.4	11.6	3.0	0.6	7.1	12.8	11.6	26.7	41.8
Benishangul-Gumuz	19.1	31.2	24.1	21.4	4.3	2.6	5.6	6.2	29.7	55.9
SNNPR	34.8	24.1	16.9	18.2	6.0	1.6	1.5	3.1	9.1	84.7
Gambella	24.6	35.1	17.3	15.6	7.5	3.6	6.1	4.9	15.1	70.3
Harari	1.7	21.4	20.3	32.5	24.1	0.0	0.3	0.9	1.8	97.0
Addis Ababa	-	-	-	-	-	0.0	0.1	0.2	0.8	99.0
Dire Dawa	20.9	42.5	19.8	9.4	7.3	0.0	0.6	0.2	6.5	92.7
National	23.8	25.5	23.7	21.3	5.7	0.7	1.6	3.0	11.8	82.9

Source: Computed from 2016 WMS

Household total expenditure Quintiles

Income, consumption, and wealth are three dimensions of the broader concept of economic well-being. The consumption of goods and services is a primary component of economic wellbeing and, as such, a primary indicator of living standards. Wealth and income are available to support consumption, today and in the future (through the saving that income generates). Other things being equal, a person with a higher level of consumption is regarded as having a higher level of economic well-being than someone with a lower level of consumption. Consumption needs can be met through the spending of income, through the running down of wealth, and through borrowing. To gauge the proportion of the poor (as approximated by household expenditure) in each region, the overall households were put together into quintile groups according to their consumption expenditure. As displayed in Figure 6.3, Amhara has the largest share of its population in the lowest expenditure quintile (34 percent) and the smallest share of the upper quintile (Q5). The largest share of the population of Somali fall in the third and fourth quintiles (62 percent) while Oromia has half of its population in these categories. On the other hand, the three dominantly urban Addis Ababa, Harari, and Dire Dawa have large share in the upper quintile (Q5) but very small share of the poorest quintile (Q1). Some 61 percent of the population of Addis Ababa are concentrated in the upper quintile.

Figure 6.3: Percent of households in each consumption/ expenditure Quintile by Region
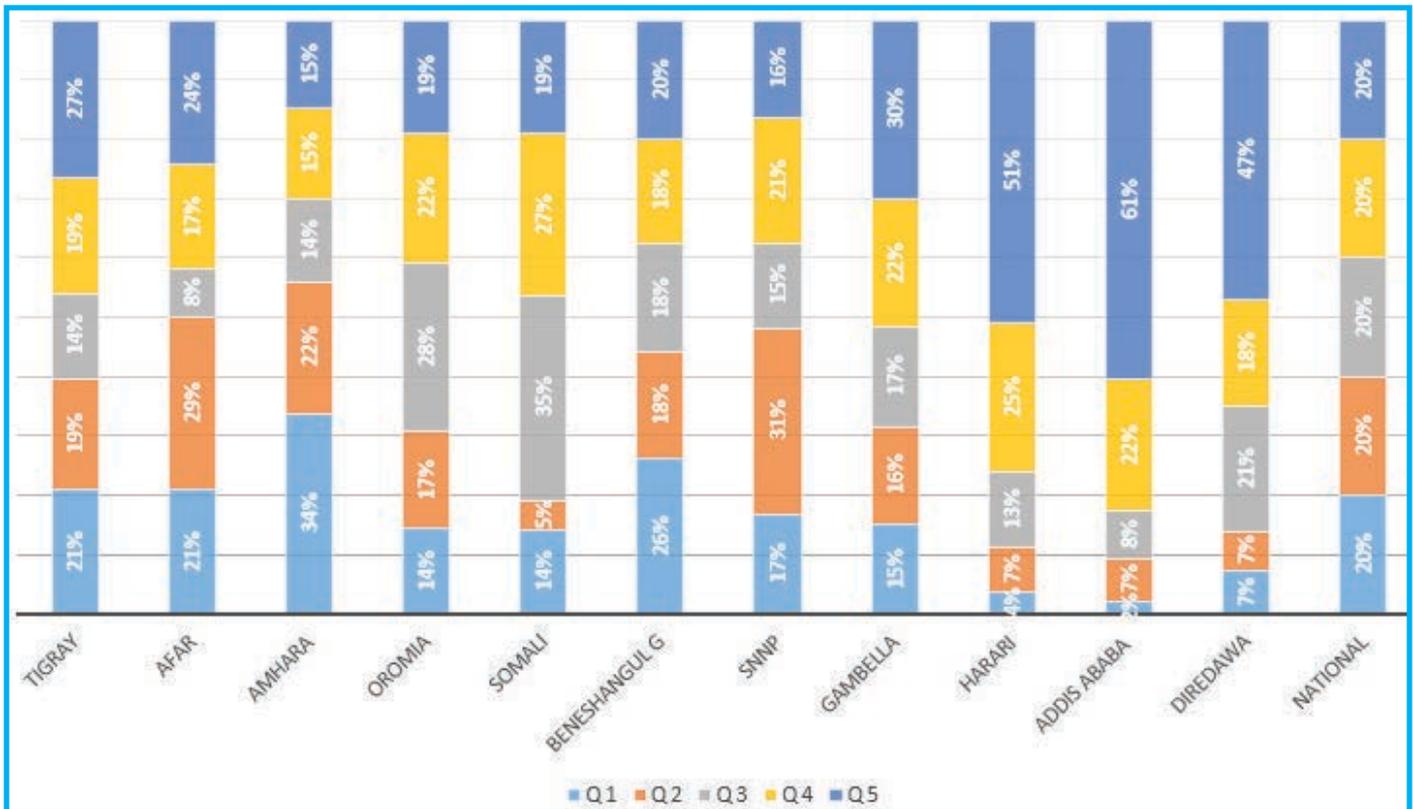
Source: Computed from 2016 HCES

Figure 6.4 displays the proportion of households in each of the consumption expenditure quintiles by place of residence. Nearly half of the population residing in rural areas are in the first and second quintile groups, while only 11 percent of the population falls in the upper quintile of consumption expenditure. The likelihood of falling into lowest quintile (Q1) is highest in small towns while it is lowest in large cities. On the other hand, the opposite holds for the likelihood of becoming in the upper quintile, larger cities have higher proportion of their population in the upper quintile while small towns have smaller proportion. This may mean that big cities have larger proportion of population with higher level of living standard while people in the lowest standard are concentrated in rural areas and small towns.

Figure 6.4: Percent of households in each consumption/ expenditure Quintile by Place of Residence
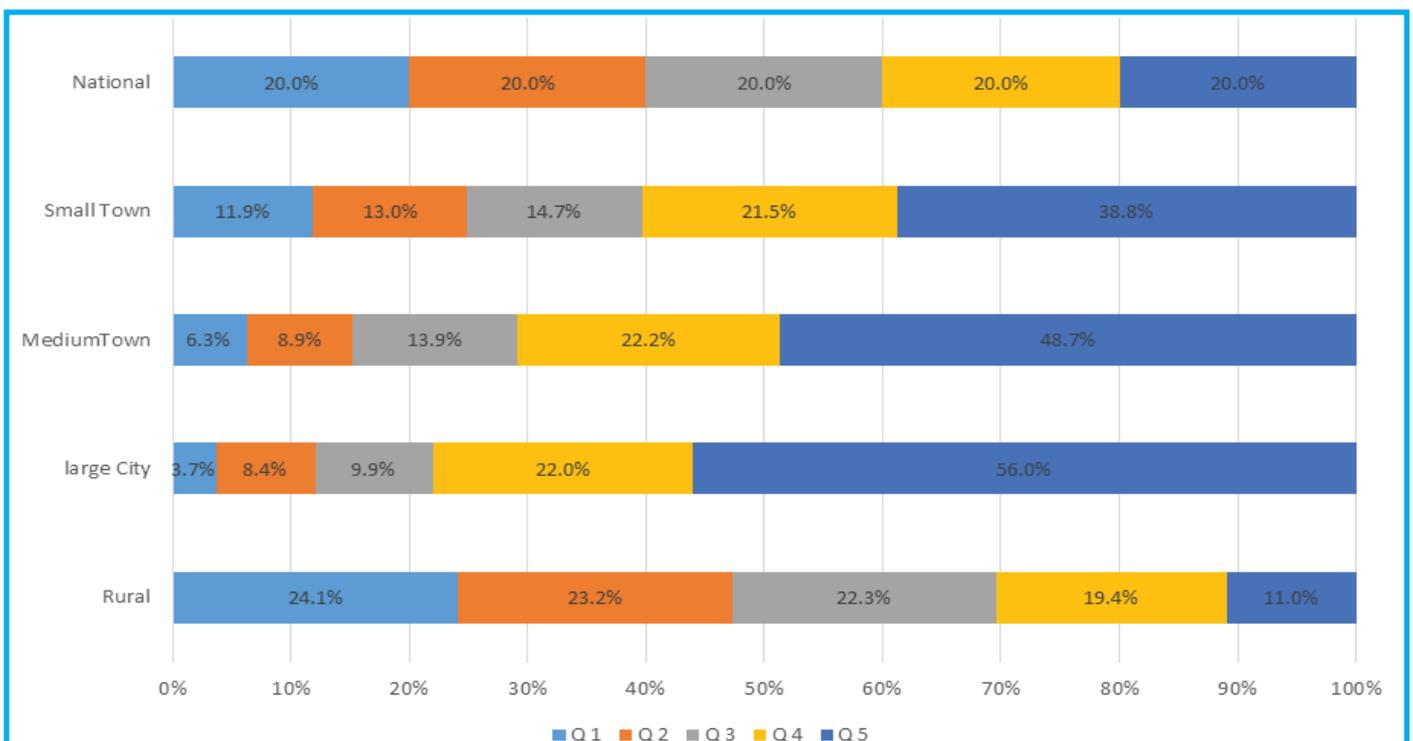

Source: Computed from 2016 HCES

Share of Household Expenditure on Food

The share of expenditure on food is an important indicator of households' food security and economic vulnerability. It is widely documented that poorer and vulnerable households tend to allocate higher share of their expenses on food in relation to other consumed items/services. According to Engel's Law, the share of income spent on food falls as the income of the household rises. In order to estimate household expenditure, Household Consumption Expenditure (HCE) considers cash expenses, purchases made on credit, items produced by the household (own production), and assistance received. The share of the total household budget spent on food is calculated by dividing the total amount of expenditure on food by the total expenditure on both food and non-food items. Figure 6.5 displays the trends of household expenditure spent on food over the past twenty years period. The proportion of household expenditure spent on food showed a general decreasing trend, from 65 percent in 2000 to 51 percent in 2016. This is in line with the general increasing trend of household consumption expenditure over the past fifteen years. This is not to mean that the actual expenditure on food has decreased over time. Rather, the real per adult equivalent expenditure on food showed an increase from 2,734 Birr in 2000 to 6,342 Birr in 2016, both expressed in 2010/11 price terms. The share of total household budget spent on food showed a general decline, albeit the increase in real expenditure on food because the expenditure on non-food items increased even more.

Figure 6.5: Percentage of Share of food expenditure (1996 to 2016)
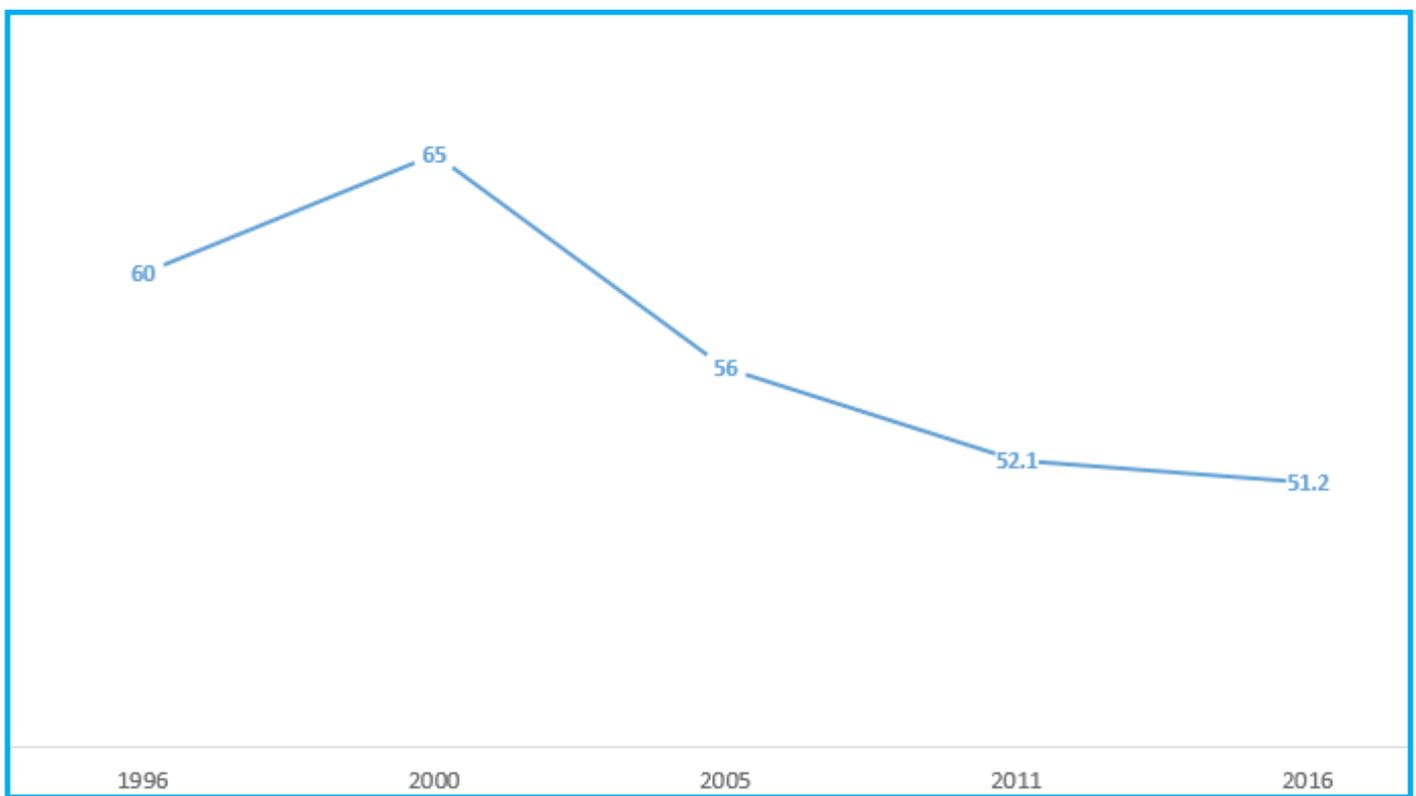
Source: Computed from HCE Surveys

Somali shows the largest share of consumptioexpenditure on food, followed by SNNPR and Gambella. On the other hand, the share of food expenditure is lowest in Tigray and Addis Ababa. The share of food expenditure in rural Ethiopia is higher than in urban Ethiopia.
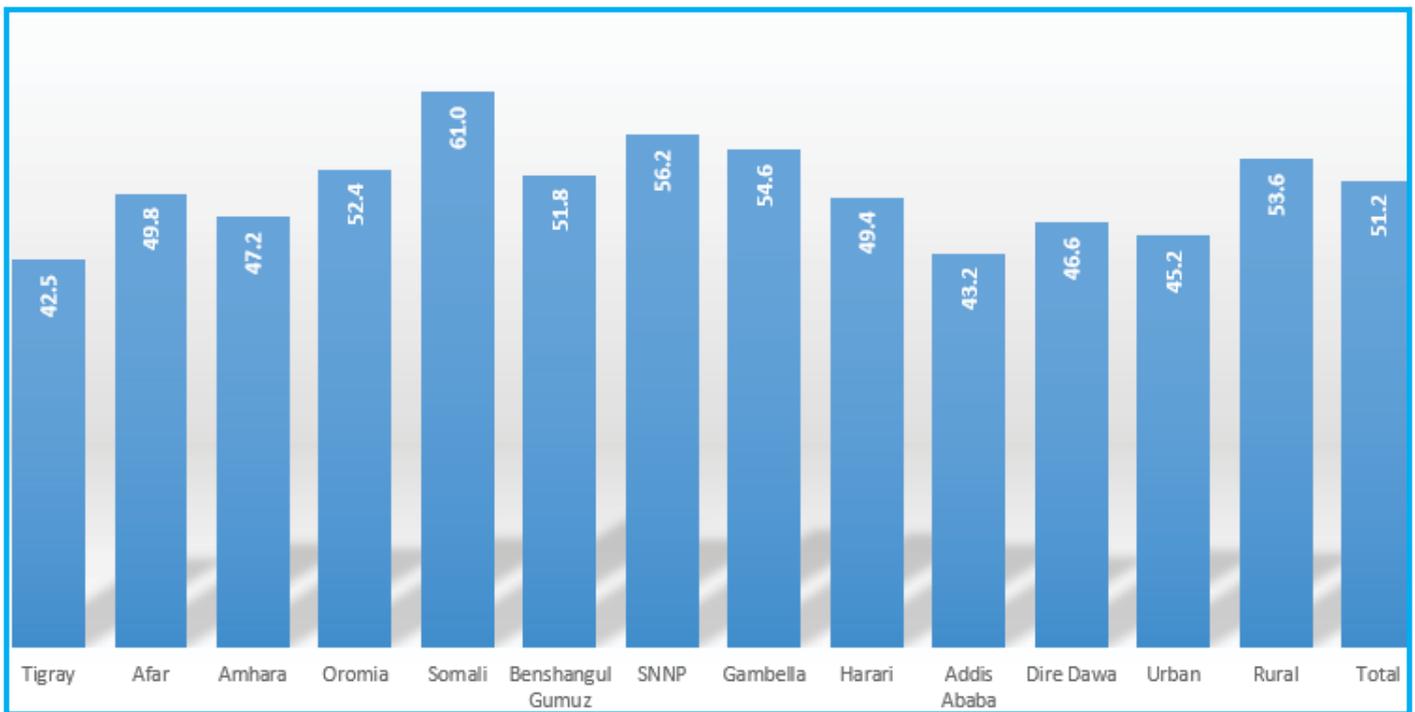
Source: Calculated from 2016 HCES

The food share of expenditure was further classified into categories. According to IFPRI guidance, households spending more than 75 percent of their expenditure on food are highly vulnerable; while households putting less than 50 percent of their expenditure on food are classified to have low vulnerability. As depicted in Figure 6.7, over 30 percent of the households allocate more than 65 percent of their household budget on food. In Gambella and Somali, a substantial proportion of population (more than 40 percent) spending more than 65 percent of their household budget on food, implying their economic vulnerability. Addis Ababa, Dire Dawa, and Harari have the least economic vulnerability as measured by expenditure share of food.

Figure 6.7: Percentage distribution of households by food expenditure share categories by region
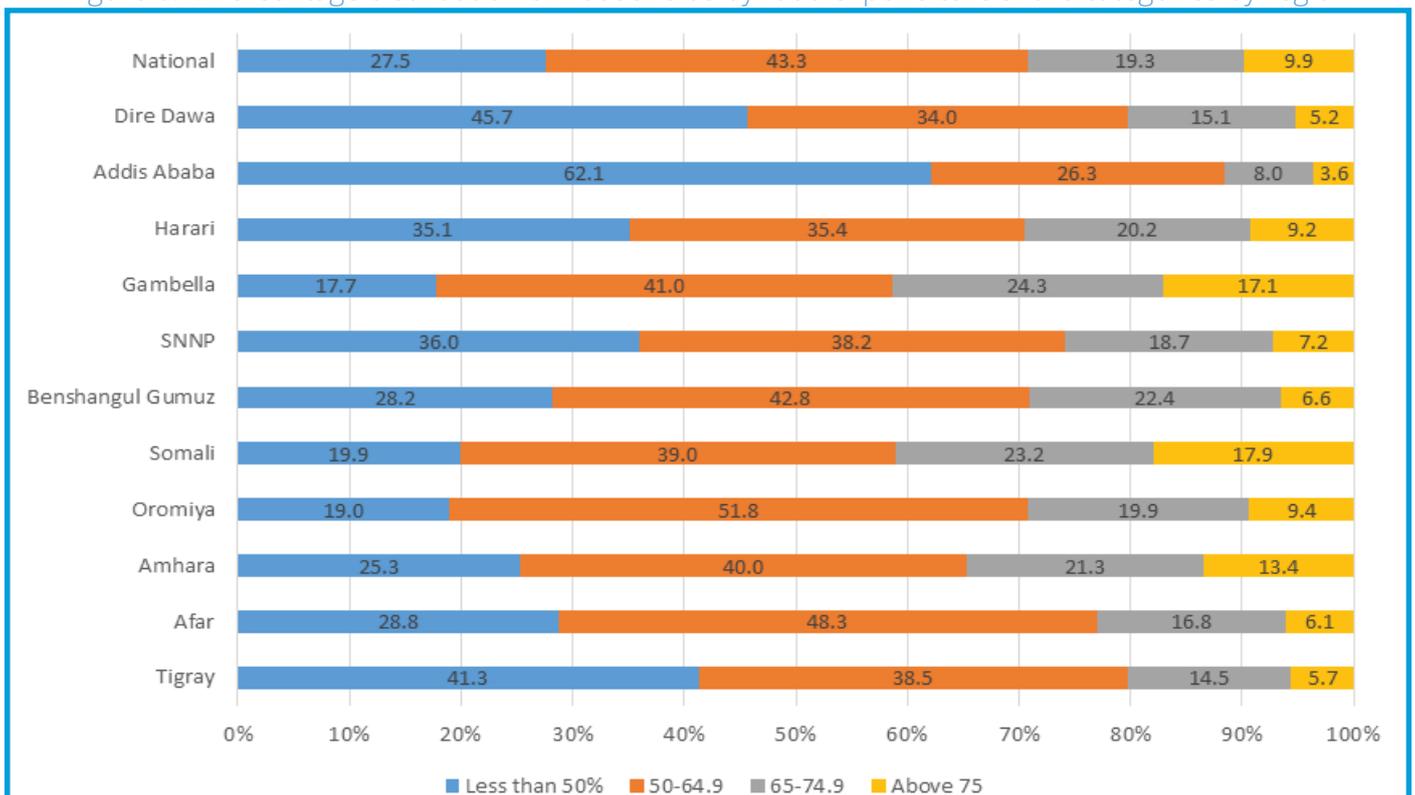
Source: Computed from HCES 2015/16

The results presented in Table 6.4 do not suggest consistent pattern in accordance with household consumption expenditure by quintile groups. The data suggest that vulnerability to food insecurity is more of a rural phenomenon, as measured by the percentage share of food. In rural Ethiopia, more than 32 percent of households spend more than 65 percent of their expenditure on food compared to 19.7 percent of their urban counterparts.

Table 6.4: Percentage distribution of households by food expenditure share categories by expenditure PAE and place of residence

	Less than 50% (Low)	50-64.9 (Medium)	65-74.9 (High)	Above 75 (Very high)	Total
Q 1	17.4	42.2	25.4	15.0	100.0
Q 2	26.1	45.4	21.7	6.8	100.0
Q 3	19.8	61.1	13.4	5.7	100.0
Q 4	27.7	39.9	20.7	11.7	100.0
Q 5	46.6	28.0	15.5	9.9	100.0
Urban	45.5	34.8	13.5	6.2	100.0
Rural	21.9	46.0	21.1	11.0	100.0
National	27.5	43.3	19.3	9.9	100.0

Source: Computed from 2016 WMS and HCES

[60] Jeronim Capaldo et al. (2010). A Model of Vulnerability to Food Insecurity. FAO

[61] Assets used for final construction of WI: Blanket, mattress, stove (kerosene...combined), watch, fixed telephone line, mobile phone, radio, TV, dish, sofa, chair, jewels, wardrobe and shelf.

# Nutritional Status of Children and Women

This section is based on data from the Ethiopia Demographic Health Surveys (EDHS) of 2000, 2005, 2011, and 2016. It provides insight into the nutritional status of children aged 6-59 months through the following anthropometric measures: stunting (i.e. low height for age), wasting (i.e. low weight for height), underweight (i.e. low weight for age) in accordance with the 2006 WHO Child Growth Standards. For non-pregnant women in the reproductive ages (15-49), body mass index (BMI) is applied to estimate the prevalence of under- and over-weight.

Stunting among Under-five Children

According to WHO, stunting is a result of poor nutrition, repeated infection, and inadequate psychosocial stimulation. Children are defined as stunted if their height-for-age is more than minus two standard deviations below the WHO Child Growth Standards median. Stunting in early life - particularly in the first 1,000 days from conception until the age of two – expressed by impaired growth - is irreversible and has adverse functional consequences on the child. In Ethiopia, the prevalence of stunting in children under-five years has consistently decreased from 58 percent in 2000 to 38.4 percent in 2016, a 33.8 percent decrease over the 16 years period (Figure 7.1). The 1.3 percent per year decrease registered over the past 16 years is one of the fastest reductions in stunting seen in Africa, indicative of improvements in overall socioeconomic conditions of a country. However, out of the total estimated 15.2 million under-five population in the country, nearly 5.8 million under-five children are stunted, meaning these children are prone to the long-lasting harmful consequences of stunting, including diminished mental ability and learning capacity, poor school performance in childhood, reduced earnings and increased risks of nutrition-related chronic diseases, such as diabetes, hypertension, and obesity in future.

Figure 7.1: Prevalence of malnutrition among under-five children in Ethiopia (2000-2016)
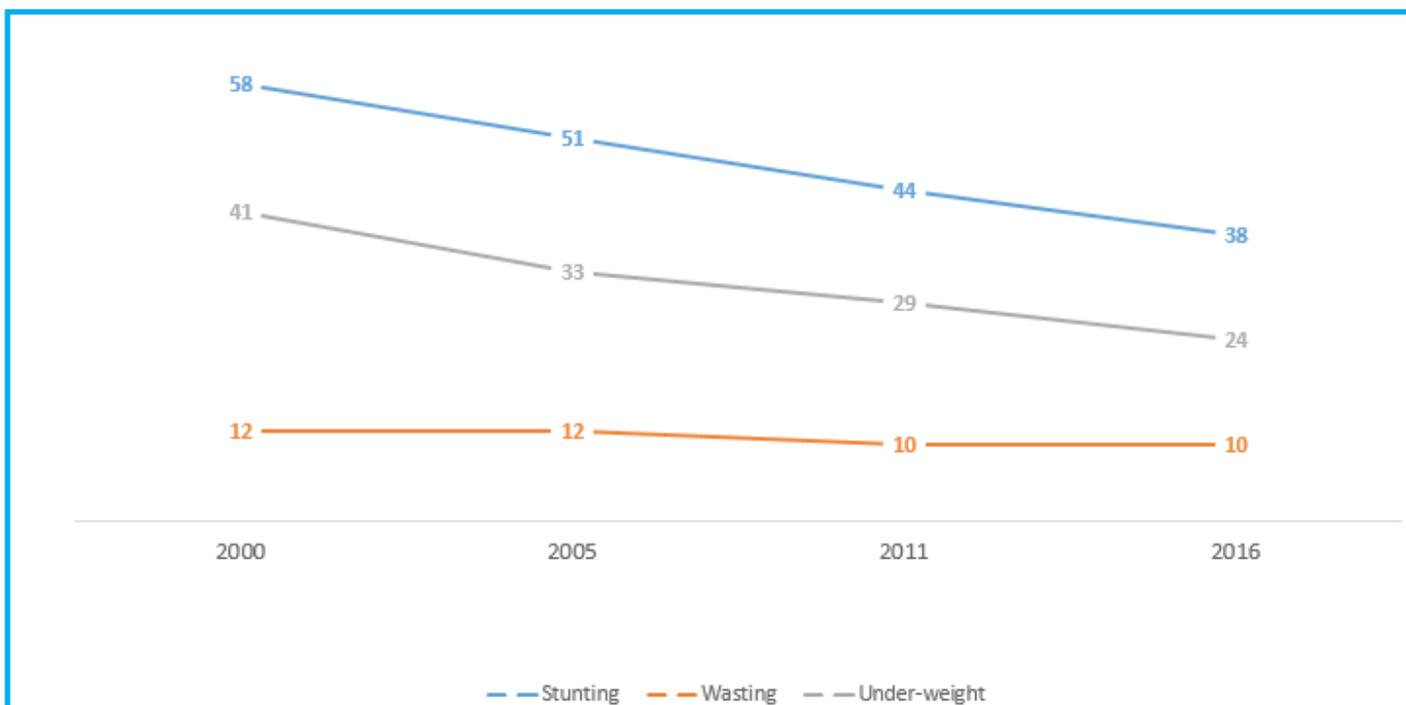

Source: EDHS 2000, 2005, 2011, and 2016

A closer look at the distribution of stunting across regions, as well as urban and rural set-tings, shows a heterogeneous pattern with the highest levels of stunting seen in Amhara (46.3 percent), Beneshangul-Gumuz (42.7 percent), and Afar (41.1 percent). Addis Ababa and Gambella observed the lowest level of stunting prevalence at 14.6 percent and 23.5 percent, respectively.

Furthermore, higher prevalence of stunting was found in rural (39.9 percent) compared to urban areas (25.4 percent).

As depicted in Figure 7.2, the levels of stunting in Ethiopia stands substantially higher compared to other East African countries such as Kenya (26 percent) and Uganda (34.2 percent).

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Figure 7.2: Prevalence of Stunting in Sub-Saharan African Countries

Country	Prevalence
Burundi (2016/17)	55.9
Eritrea (2010)	50.3
Nigeria (2016/17)	43.6
DRC (2013/14)	42.6
Niger (2016)	42.2
Chad (2014/15)	39.9
Ethiopia (2016)	38.4
Angola (2016)	37.6
Malawi (2015/16)	37.1
Rwanda (2015)	36.7
Tanzania (2015/16)	34.4
Cameroon (2014)	31.7
Uganda (2016)	28.9
Zimbabwe (2015)	26.8
Kenya (2014)	26
Coted'ivoire (2016)	21.6
Ghana (2014)	18.8
Senegal (2016)	17
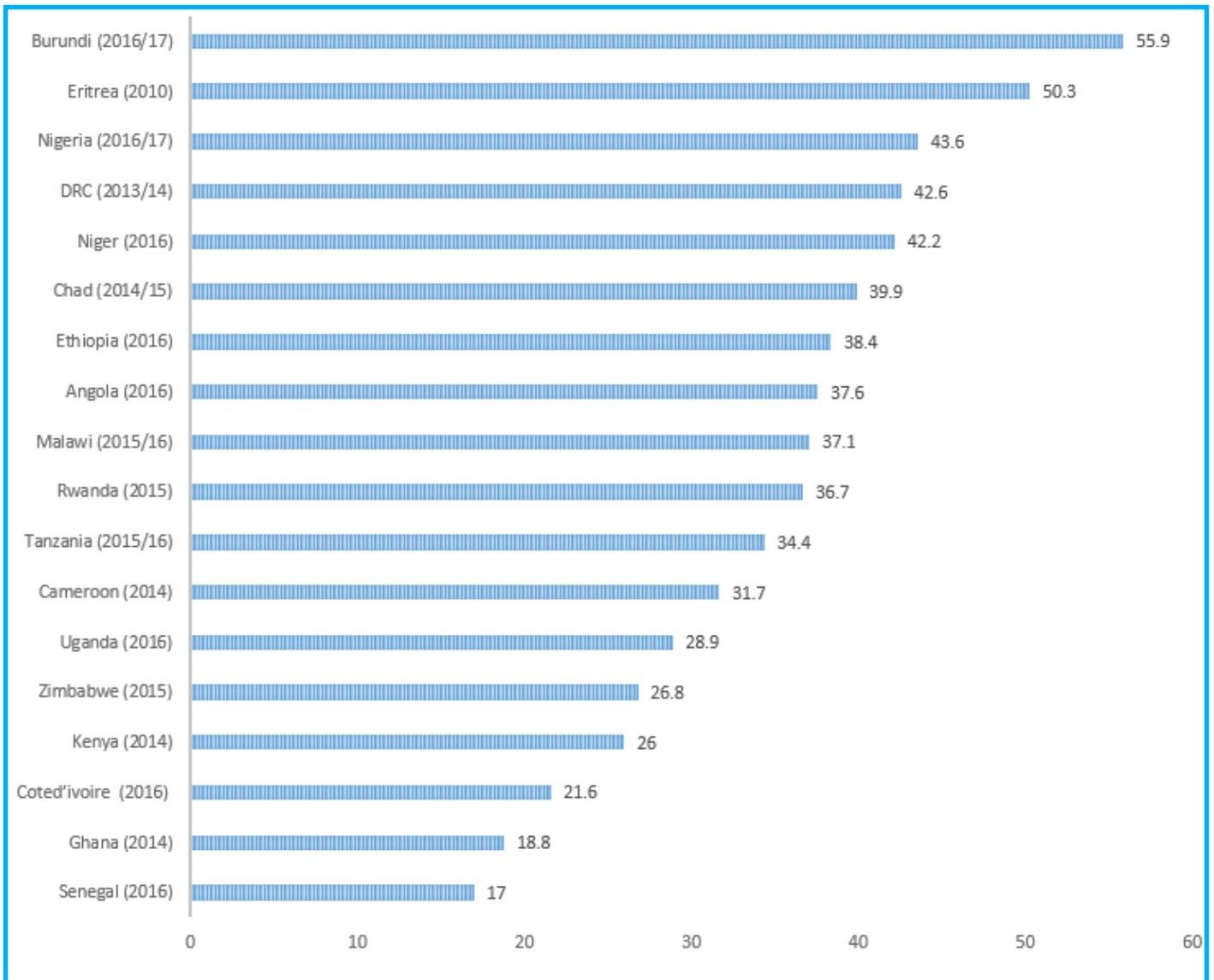
Sources: Compiled from DHS, MICS, CFSVA Reports, and national survey reports

The prevalence of stunting between 2011 and 2016 also showed varying trends across regions as well as rural and urban settings. All regions registered a decrease in prevalence of stunting between 2011 and 2016, except for Dire Dawa and Harari, where a significant increase was observed. Rural settings showed a decrease during the same period but remained well above stunting levels seen in urban areas. Tigray, Afar, and Addis Ababa showed extraordinary improvement in terms of reducing the prevalence of stunting among under-five chldren over the

five years period. Whereas Dire Dawa and Harari showed an increased prevelance during that same period by 10.7 percent and 7.4 percent, respectively. Although Amhara showed a modest improvement (11 percent), it remained the region most affected by stunting. Between 2011 and 2016, urban Ethiopia registered a 19.4 percent reduction of stunting compared to the 13.6 percent reduction in rural Ethiopia. The 1.2 ppt/yr stunting reduction observed in the country is great achievement in comparison to the progress in other African countries.

| Region	2011	2016	% of change (2011-2016)	PPt/year change
Tigray	51.4	39.3	-23.5%	-2.4
Afar	50.2	41.1	-18.1%	-1.8
Amhara	52.0	46.3	-11.0%	-1.1
Oromia	41.4	36.5	-11.8%	-1.0
Somali	33.0	27.4	-17.0%	-1.1
Beneshangul Gumuz	48.6	42.7	-12.1%	-1.2
SNNPR	44.1	38.6	-12.5%	-1.1
Gambella	27.3	23.5	-13.9%	-0.8
Harari	29.8	32	7.4%	0.4
Addis Ababa	22.0	14.6	-33.6%	-1.5
Dire Dawa	36.3	40.2	10.7%	0.8
Place of Residence				
Urban	31.5	25.4	-19.4%	-1.2
Rural	46.2	39.9	-13.6%	-1.3
National	**44.4**	**38.4**	**-13.5%**	**-1.2**

Source: Computed from 2011 and 2016 EDHS

Figure 7.3 presents the regional prevalence of severe stunting (-3 SD) and overall stunting (below -2SD). In 2016, Amhara, Beneshangul-Gumuz, Afar, and Dire Dawa have very high level of stunting exceeding WHO's critical threshold of public health significance of 40 percent.[62] Somali and Gambella are categorized as poor, while Addis Ababa is the only one region that has acceptable level of stunting.

Afar, Beneshangul-Gumuz and SNNPR have the highest level of severe stunting (HAZ below -3SD) while Addis Ababa and Gambella have the lowest.

Figure 7.3: Prevalence of severe stunting (below -3 SD) and overall stunting (below -2 SD) by region and place of residence
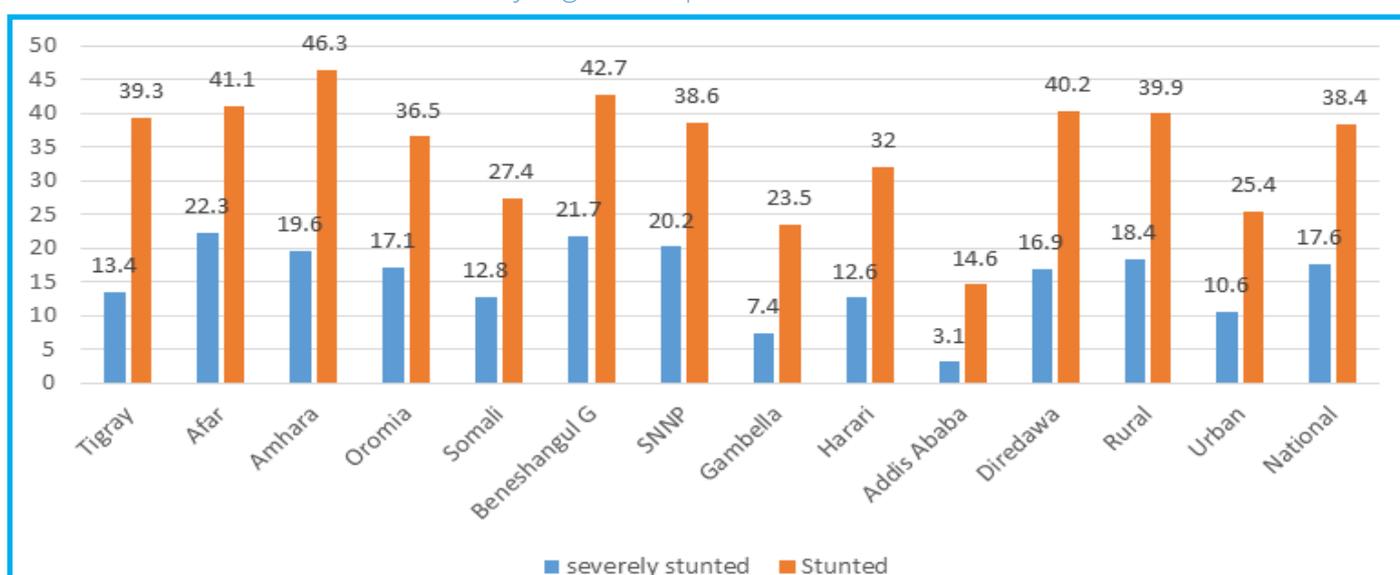

Source: 2016 EDHS

In developing countries, stunting follows an age pattern: prevalence starts to rise before five months, the process then slows down and from the age of three mean heights run parallel to the reference values. Therefore, the age of the child modifies the interpretation of the findings: for children in the age group below 2-3 years, low height-for-age probably reflects a continuing process of "failing to grow" or "stunting", while for older children, it reflects a state of "having failed to grow" or "being stunted". [63] As depicted in Figure 7.4, analysis by age groups confirms that stunting shows steep increase between the 12 to 23 months of age, implying growth faltering during these age periods. The level of stunting peaks at 47.8 percent among children in the age group 24-35 months. Severe stunting shows an increasing trend during the second and third year of the child, with the highest proportion of severe stunting in children age 36-47 months (around 23 percent).

Figure 7.4: Prevalence of severe stunting (below -3SD) and overall stunting (below -2SD) by age category (in months)
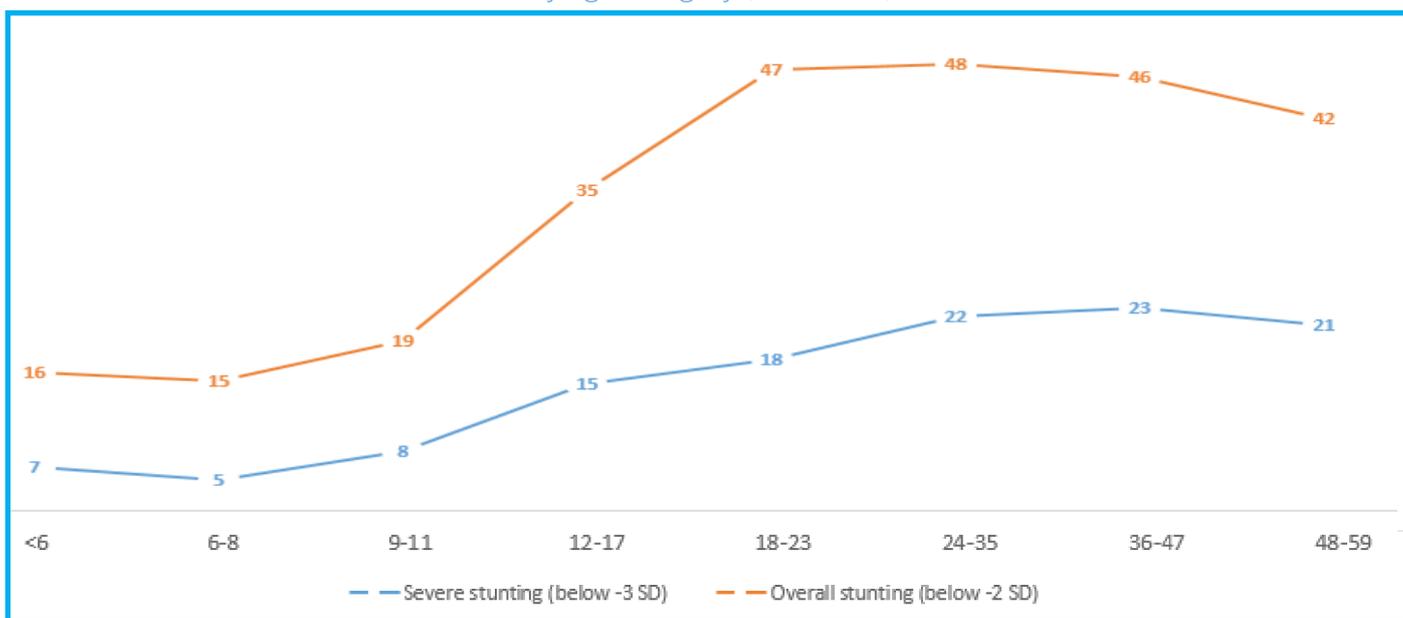
Source: Computed from EDHS 2016

As displayed in Figure 7.5, the prevalence of stunting is inversely correlated with wealth quintiles, as the wealth quintile increases the likelihood of children in the household falling into the stunting category decreases. This may mean that children from poor households are at a greater risk of being stunted than children from richer households. This may be attributed to the fact that with less income to spend on proper nutrition, children from underprivileged households are more prone to growth failure due to insufficient food intake, higher risk of infection, as well as lack of access to basic health care services.

Figure 7.5: Prevalence of malnutrition (<-2SDs HAZ) among under-five children in Ethiopia by Wealth Quintiles, 2016
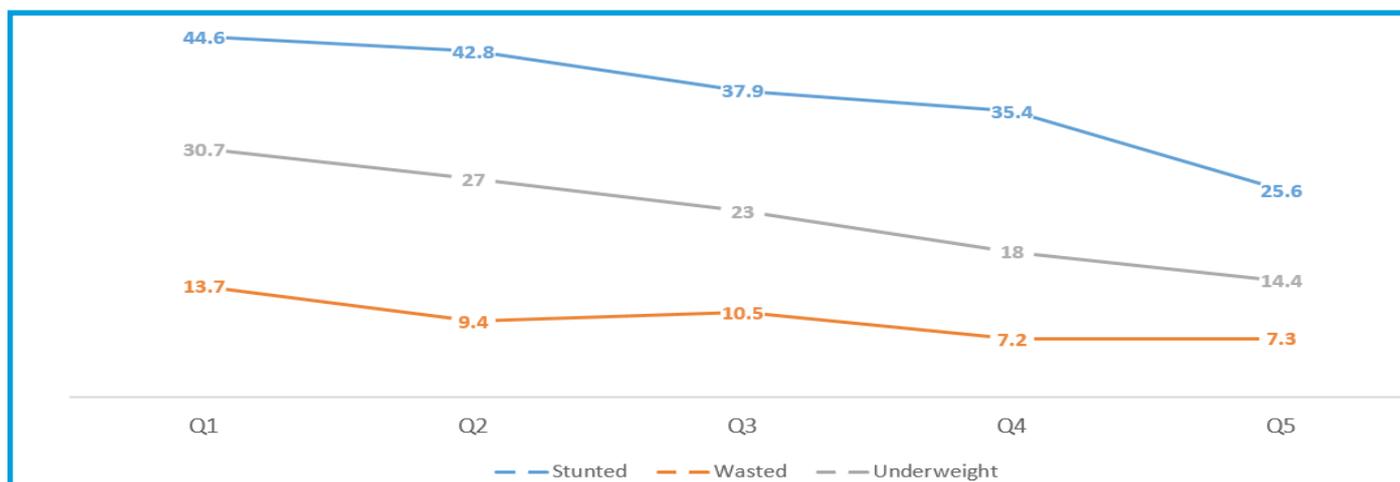

Source: Computed from EDHS 2016

Underweight among under-five Children

Underweight is a well-established child health indicator for stunting and acute malnutrition. It refers to low weight-for-age, i.e. when a child is too thin or too small for his/her age. It is defined as below 2 standard deviation from median weight-for-age of the reference WHO population. Children under the age of 5 years whose weight-for-age is below minus two standard deviations (-2 SD) from the reference population median are classified as underweight, while children whose weight-for-age is below minus three standard deviations (-3 SD) from the reference median are considered severely underweight. Growth charts based on Weight for

Age Z scores (WAZ) reference curves are used for growth monitoring in Mother and Child Health Programmes and for attainment of the Millennium Development Goals. As displayed in Figure 7.1, the prevalence of underweight nationally shows a consistent decline from 41 percent in 2000 to 24 percent in 2016. This means, Ethiopia has managed to reduce the prevalence of under-weight among children under 5 years of age by 41.5 percent over the period of 16 years. The current state of under-weight in Ethiopia is considered as " serious" according to WHO classification.[64]

FIgure 7.6: Percentage of under five classified as malnourished by age (in months)
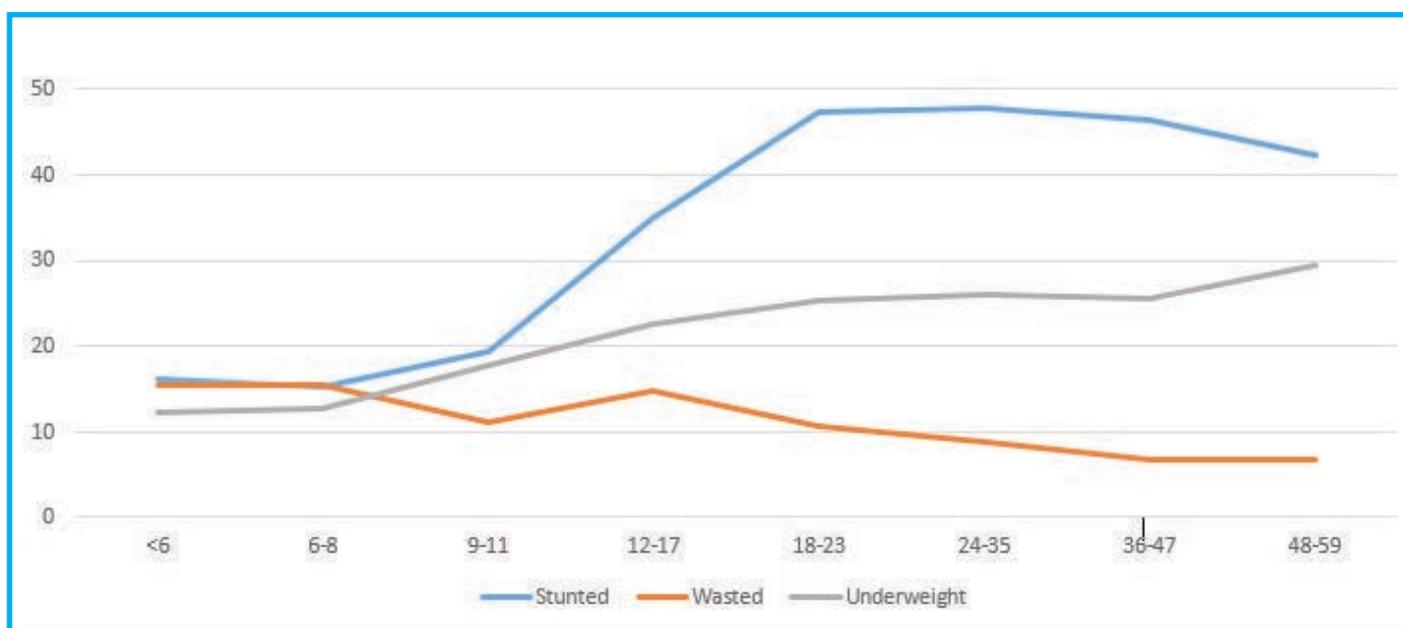

Source: Computed from EDHS 2016

Wasting among under-five Children

Acute malnutrition in children aged 6-59 months can be either moderate or severe, depending on the severity of wasting. Acute malnutrition is closely linked to mortality. Both moderate and severe acute malnutrition increase the risk of mortality as compared to a healthy child, by 3 to 4 times and 9 times, respectively. According to the WHO and UNICEF Joint Statement,[65] wasting or thinness indicate in most cases a recent and severe process of weight loss, which is often associated with acute starvation and/or severe disease.[66] The analysis of acute malnutrition in Ethiopia suggests a slight improvement in the prevalence between 2000 and 2016 (Figure 7.1). The prevalence of acute malnutrition was around 12 percent in 2000 but declined to 10 percent in

2016. This means that approximately 1.52 million under-five children out of the total estimated population of 15.2 million are acutely malnutrition in Ethiopia. These children are at the risk of death, illness and uncertain futures where they may never reach their full potential. Out of all regions in Ethiopia, only Addis Ababa has "acceptable" levels of acute malnutrition (< 5 percent), while SNNPR, Amhara and Dire Dawa are classified as poor (5 to 9 percent). Oromia, Tigray, Beneshangul-Gumuz, Gambella and Harari have rates between 10 to 14 percent, representing a serious public health concern. Afar and Somali, predominately pastoral and agro-pastoral regions, exceeded the emergency threshold of 15 percent. Acute malnutrition is more prevalent in rural Ethiopia as compared to urban Ethiopia (Figure 7.7).

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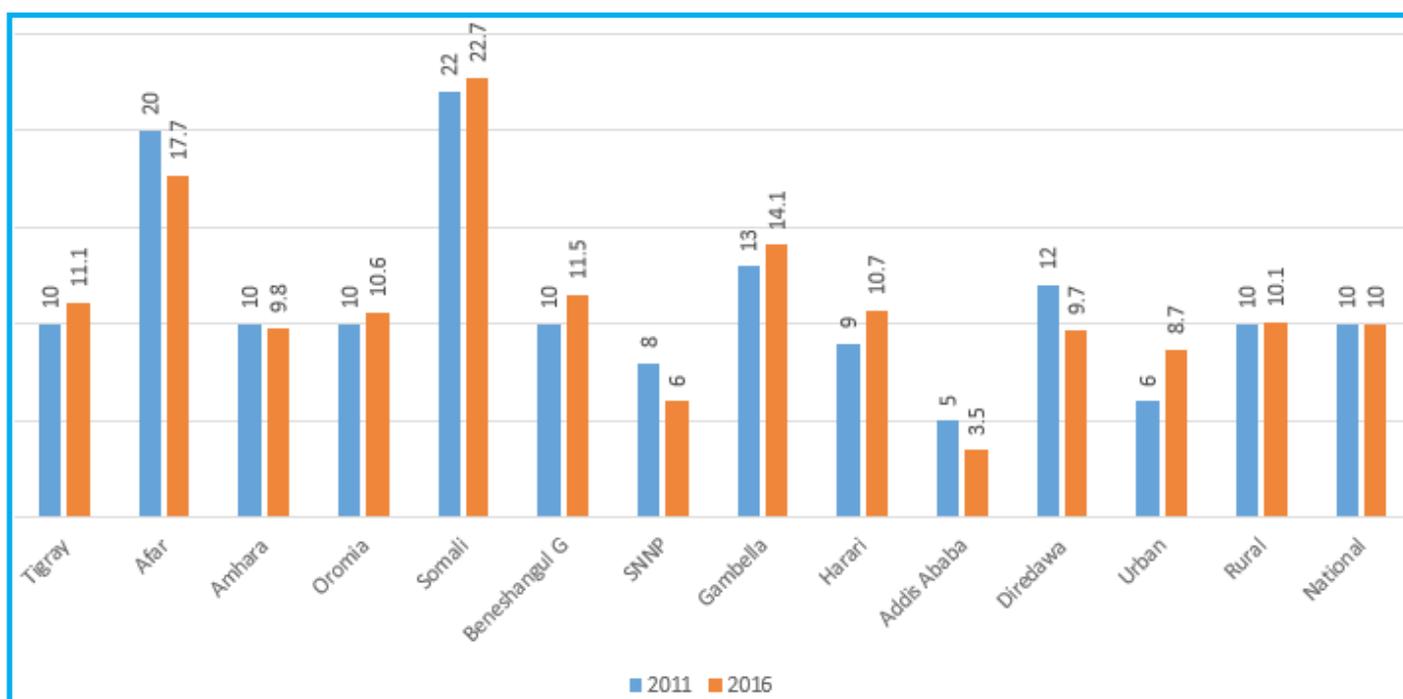
Source: Computed from EDHS 2016

As displayed in Figure 7.8, the prevalence of acute malnutrition in Ethiopia is higher than East African countries like Kenya (4 percent), Uganda (3.6 percent), and Burundi (5.1 percent). In order to tackle acute malnutrition in Ethiopia, coordinated efforts are needed focusing on prevention in all contexts, more effective treatment and coordination between treatment of moderate and severe acute malnutrition, and better linking of prevention and treatment.

Figure 7.8: Prevalence of wasting in Sub-Saharan African Countries
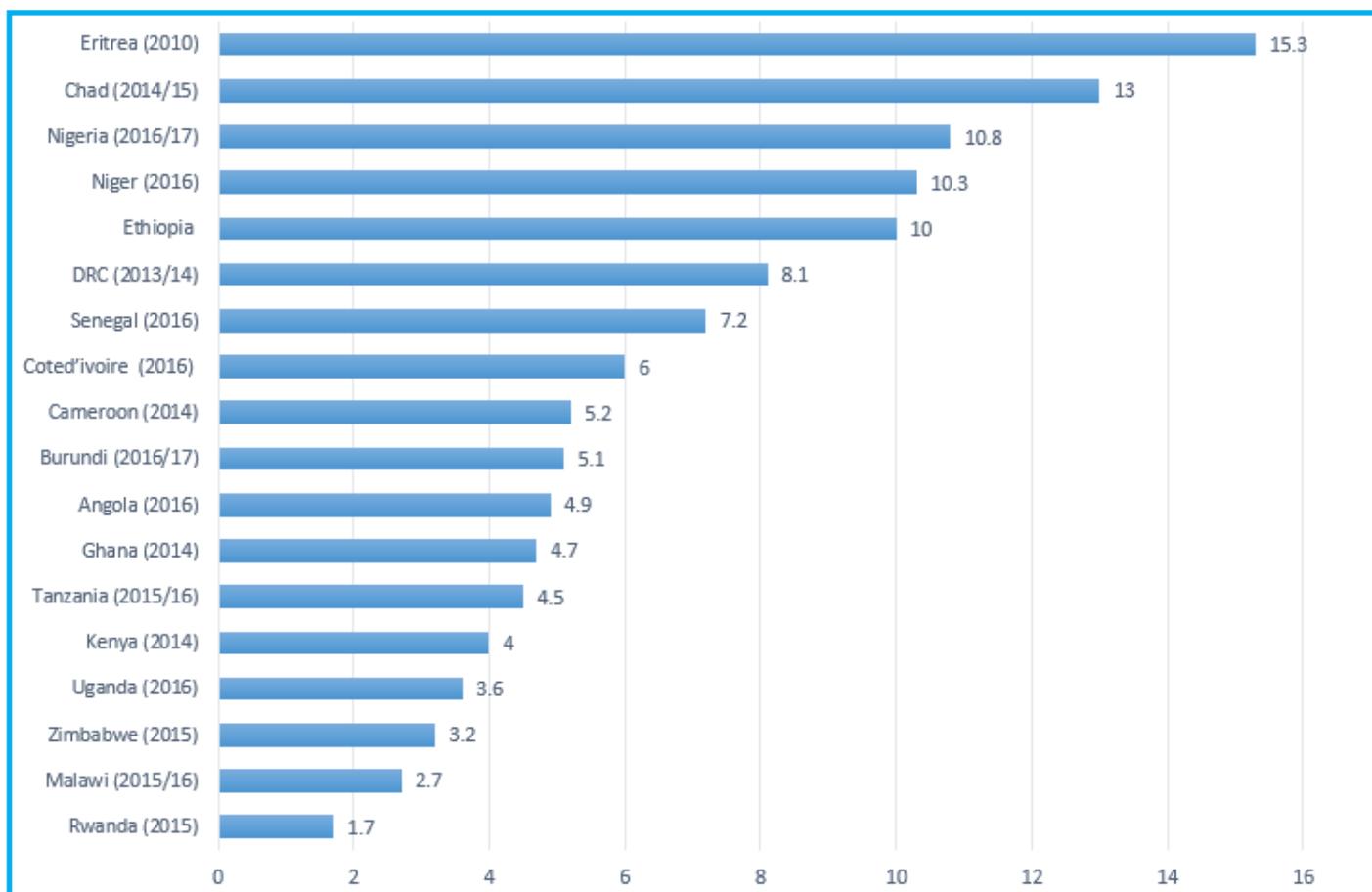
Sources: Compiled from DHS, MICS, CFSVA Reports, and national survey reports

Nutritional Status of Adults Women

The analysis in this section is based on the anthropometric data on height and weight for women age 15-49 from the 2016 Ethiopian Demographic and Health Survey (EDHS). Body Mass Index (BMI), the weight in kilograms divided by the square of the height in meters (kg/m2), is applied to assess underweight in adult non-pregnant women. Figure 7.9 portrays the nutritional status of non-pregnant women as measured by BMI based in the EDHS 2016 data.

Nationally, some 70 percent of the women fall under the "normal" BMI category, which is be-tween 18.5 and 25 BMI, while 22.3 percent are underweight (18.5 >BMI) as a result of inadequate energy intake and/or disease. SNNPR, Amha-ra and Beneshangul-Gumuz have the highest prevalence of normal nutritional status women in reproductive age. The lowest prevalence of underweight in women was found in Addis Ababa (13.4 percent) and SNNPR (14.9 percent).

In contrast, the highest proportion of underweight in women was observed in Afar (39.1 percent), Tigray (34 percent), Gambella (31.8 percent) and Somali (31.2 percent). The low BMI in these regions increases the risk of in-utero stunting and low birth weight.

Overweight and obesity (BMI> 25 kg/m2), another major public health problem, is relatively high in the three urban-dominated administrative areas of Addis Ababa, Dire Dawa and Harrari. The prevalence of overweight and obesity among non-pregnant women of reproductive age (15-49) stands at 29.4 percent in Addis Ababa, while about one-in-five women in Dire Dawa and Harar are overweight or obese. Overweight and obesity is usually associated with excessive en-ergy intake and sedentary lifestyle and increase the risk for non-communicable diseases such as diabetes and hypertension.

Figure 7.9: Percent of women age 15-49 by their Body Mass Index (BMI) level and region

Region	Normal	Mild thin	Moderate and Severe thin	Overweight	Obese
Tigray	60	21	13	5	1
Affar	53	19	20	7	2
Amhara	74	16	7	3	0
Oromia	68	18	7	6	2
Somali	54	18	14	11	4
Benishangul-Gumuz	73	15	15	6	1
SNNPR	80	11	4	5	1
Gambela	60	19	13	6	2
Harari	59	15	6	16	4
Addis Ababa	57	9	5	22	8
Dire dawa	56	15	7	16	6
Total	70	16	7	6	2
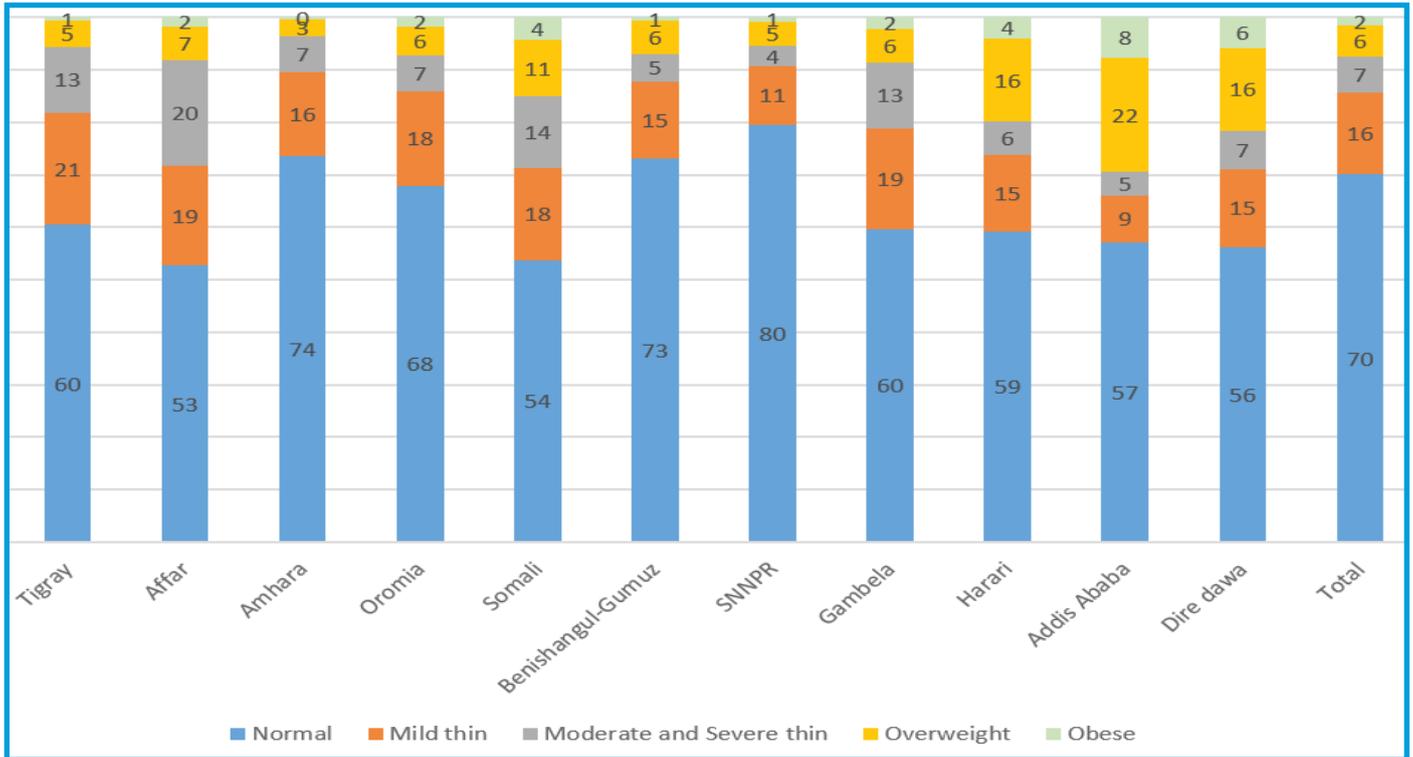
Sources: Compiled from DHS, MICS, CFSVA Reports, and national survey reports

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[62]WHO thresholds for stunting: acceptable prevalence should be < 20 percent, poor comprised between 20 and 30 percent, serious between 30 and 40 percent, and critical above 40 percent.

[63]WHO, Global Database on Child Growth and Malnutrition at http://www.who.int/nutgrowthdb/about/introduction/en/index2.html.

[64]Underweight thresholds are respectively set at 10 percent (acceptable), 20 percent (precarious), 30 percent (serious) and above 30 percent (critical). SAM prevalence is considered critical if above 2 percent.

[65]WHO Child growth standards and the identification of severe acute malnutrition in infants and children, A Joint Statement, WHO and UNICEF, 2009

[66]The prevalence of wasting is usually below 5 percent even in poor countries unless there is severe food shortage. According to WHO classification, wasting prevalence between 10-14 percent are regarded as serious, and above or equal 15 percent as critical.

# Shocks, Coping Strategies and Perceptions of Food Insecurity

This section analyzes the shocks that households experience and the strategies they adopted to cope. Coping strategies have the objective to protect households from any potential negative impact on the household's welfare; however, certain irreversible types of coping strategies have the potential to damage a long-term household coping capacity and lead to increased vulnerability. Households were asked whether they had faced any shocks and food shortage during the last 12 months prior to the date of interview for the analysis of shocks and its impact on household food security. To capture coping strategies, households were asked what they did when they did not have enough food or money to buy food in the month preceding the survey. The answers were a series of behaviors about how households manage or "cope" with a shortfall in food consumption.

Shocks

Approximately 10.4 percent (Figure 8.1) of households reported they had faced food shortage during the last 12 months prior to the date of interview. This varied from month to month and region to region. A trend analysis shows a clear seasonal pattern of food shortage with a decrease in the proportion of households reported food shortage from August to January following the harvest season and then start steadily increase from February to July following the lean season (Figure 8.2). The highest proportion of households out of those reported food shortage was recorded in July. Tigray, Afar, Amhara, Somali, Oromia, and Benishangul Gumuz regions have an almost similar seasonal pattern of food shortage with an increase in the proportion of households reported food shortage from June to September. In SNNPR, the proportion of households reported food shortage increases from March to June and then start declining. Crop failure is a major shock with 7 percent of households reporting that they had faced shocks during the last 12 months prior to the date of interview, followed by a reduced income of households (3.5 percent).

Figure 8.1: Percentage of households experienced food shortage during the last 12 months out of those reported food shortage
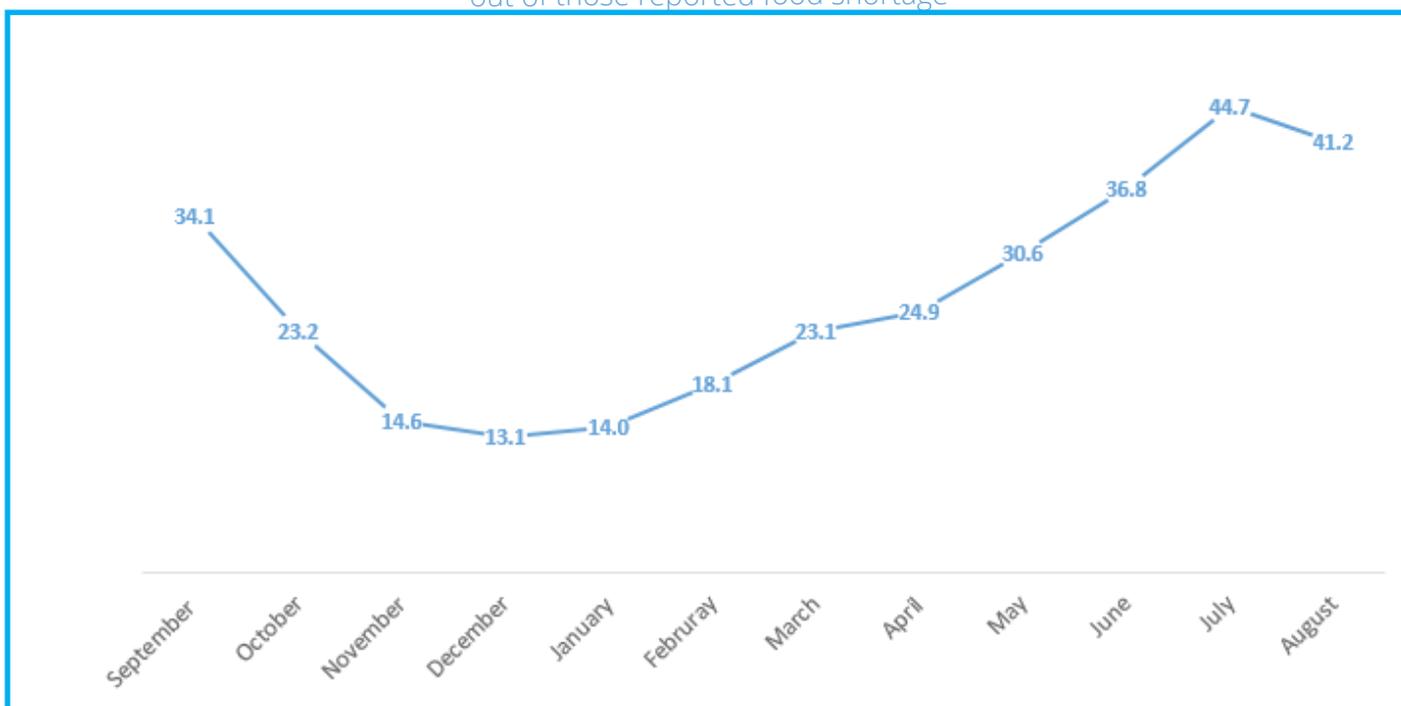
There was wide regional variation in the proportion of households reporting food shortage during the last 12 months (Figure 8.2). Harari (0 percent) and Addis Ababa (1.3 percent) reported the lowest while SNNPR (12.3 percent) and Tigray (12.1 percent) had the highest percentage of households reporting food shortage during the last 12 months. Nearly 9.5 percent of households that experienced food shortage also reported that they had faced with one to five shocks during the last 12 months prior to the date of interview. Of those that reported facing shocks during the last 12 months prior to the date of interview, the majority (about 77 percent) reported that they had faced one to two shocks. In Amhara, Tigray and SNNPR, just over 10 percent of households reported facing more than one shocks.

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Figure 8.2: Percentage of households who reported Food Shortage During the Last 12 Months by Region
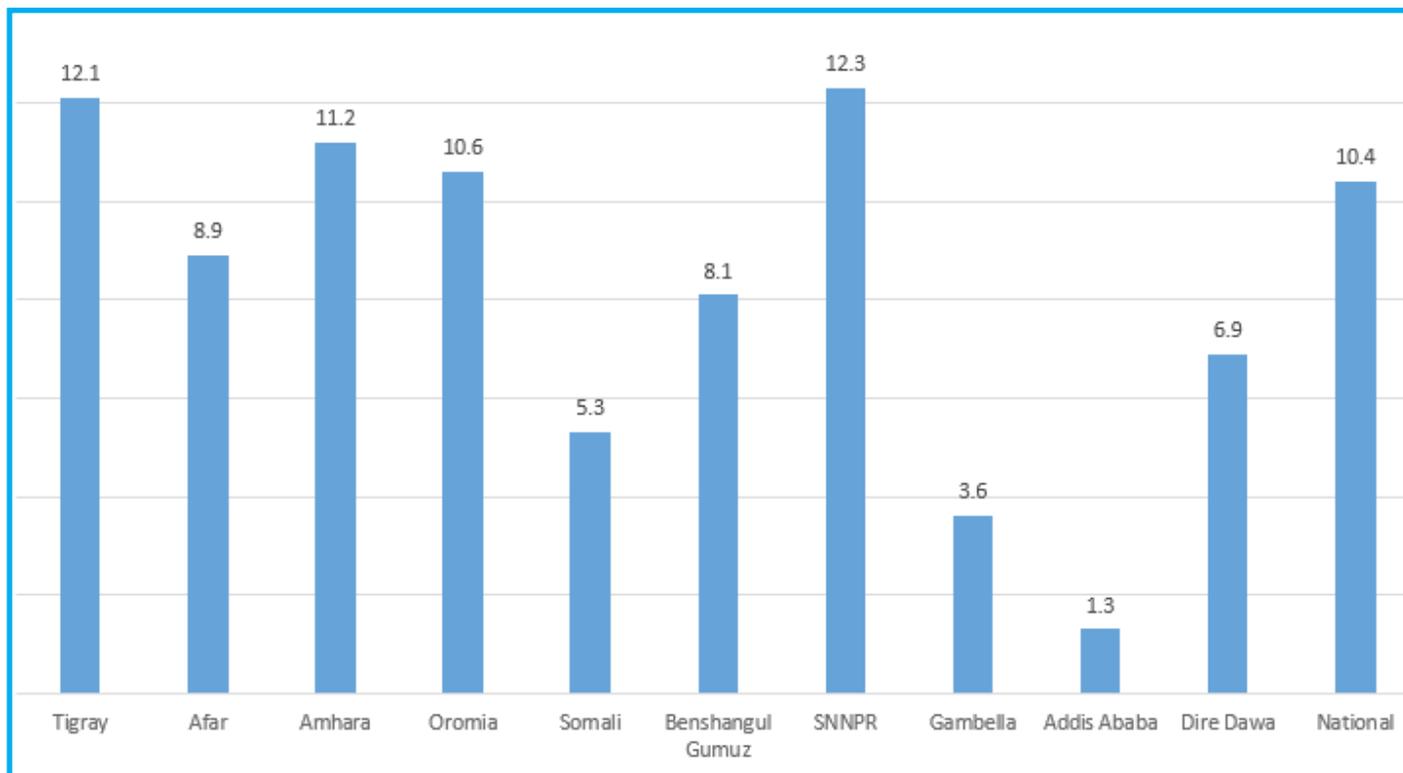
Source: Computed from 2016 WMS

Comparison by area of residence shows that a higher proportion of households in rural areas (11.3 percent) reported facing one or more shocks during the last 12 months prior to the date of interview as compared with urban households (3.9 recent). This trend is seen across for all regions (Figure 8.3). Crop failure was a leading factor for shocks followed by reduced income of household members (Table 8.1).

Figure 8.3: Percent of Households in rural and urban areas that have experienced one or more shocks

Source: Computed from 2016 WMS

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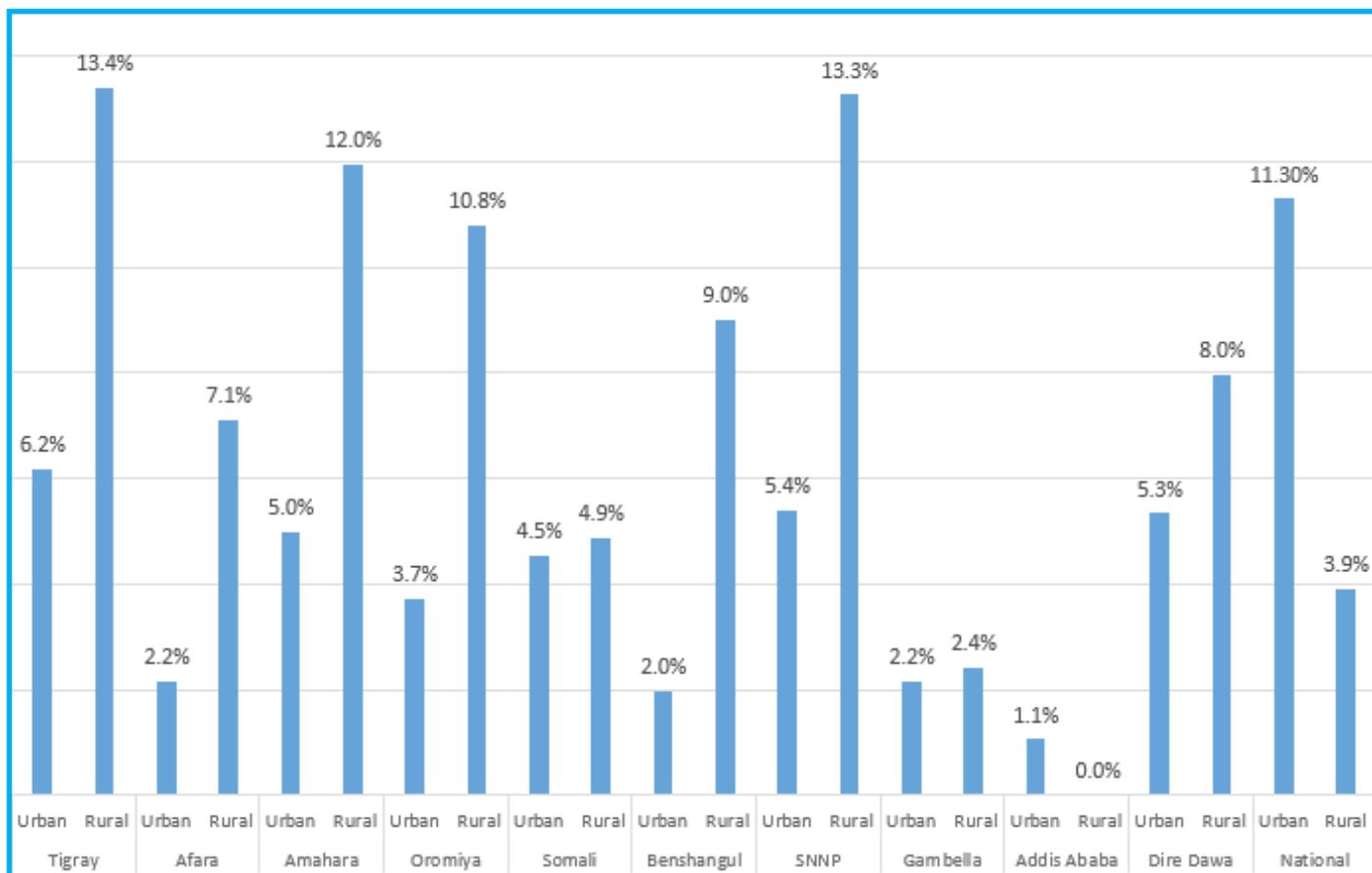
Table 8.1: Type of major shocks reported by region, area of residence and national

| Area of Residence	Region	Crop failure	Illness	Reduced income	High food prices	Human disease	Relocation of the family	Remittances cut-off	Others
Rural	Tigray	10.2%	1.1%	2.3%	1.0%	0.4%	0.4%	0.3%	2.7%
	Afar	5.4%	0.0%	6.9%	6.8%	0.0%	0.0%	0.0%	1.2%
	Amhara	9.3%	0.8%	3.5%	0.7%	0.2%	0.4%	0.1%	1.3%
	Oromia	8.5%	0.6%	2.1%	0.7%	0.3%	0.2%	0.0%	2.9%
	Somali	3.0%	0.3%	0.3%	0.2%	0.0%	0.0%	0.0%	0.2%
	Benishangul Gumuz	2.6%	1.7%	3.3%	1.6%	0.5%	0.7%	0.0%	3.8%
	SNNPR	11.3%	0.9%	8.7%	4.4%	1.3%	0.2%	0.1%	1.2%
	Gambella	2.3%	0.0%	0.0%	0.4%	0.0%	0.2%	0.0%	0.0%
	Harari	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Addis Ababa	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Dire Dawa	7.6%	0.3%	1.0%	0.3%	0.3%	0.3%	0.7%	0.7%
Urban	Tigray	2.1%	1.5%	3.0%	1.1%	0.5%	1.1%	0.2%	0.9%
	Afar	0.0%	0.5%	1.7%	0.0%	0.0%	0.4%	0.0%	0.0%
	Amhara	1.9%	0.7%	2.7%	1.1%	0.5%	0.4%	0.1%	1.7%
	Oromia	0.7%	0.9%	2.5%	1.3%	0.5%	0.9%	0.0%	0.4%
	Somali	0.2%	0.8%	2.1%	0.7%	0.0%	0.5%	1.3%	0.1%
	Benishangul Gumuz	0.0%	0.2%	0.4%	0.0%	0.1%	0.2%	0.0%	0.7%
	SNNPR	1.3%	1.4%	3.4%	3.2%	1.2%	1.5%	0.1%	0.5%
	Gambella	0.9%	0.2%	0.1%	1.2%	0.0%	0.0%	0.0%	0.2%
	Harari	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Addis Ababa	0.0%	0.2%	0.6%	0.5%	0.2%	0.2%	0.0%	0.5%
	Dire Dawa	0.0%	0.6%	5.2%	4.6%	1.4%	0.7%	0.2%	0.8%
	National	7.0%	0.8%	3.5%	1.5%	0.5%	0.4%	0.1%	1.6%

Source: Computed from 2016 WMS

Households with poor, borderline and acceptable food consumption reported crop failure shock during the last 12 months prior to the date of interview at 11 percent, 13 percent, and 5 percent, respectively (Figure 8.4). Nearly 17 percent of the households in poor and borderline food consumption group reported experiencing one or more shocks, whereas only 7 percent of the households in the acceptable food consumption group reported experiencing one or more shocks during the 12 months prior.

Food poverty and shocks have synergistic relationship. A crosstabulation of food poverty and shocks shows that a higher proportion of food poor households (15.2 percent) reported more than one shocks during the last 12 months prior to the date of interview as compared with non-food poor households (8.2 percent). This could be due to the fact that poor households, including food poor, are more vulnerable to shocks and have weak resilience capacity. Likewise, 12.7 percent of households that had less than 2,550 Kcal per adult equivalent food consumption reported that they had experienced more than one shocks during the last 12 months prior to the date of interview while only 8 percent of households that had more than 2,550 Kcal per adult consumption reported the same.

Figure 8.4: Prevalence of the most common ten shocks by food consumption groups
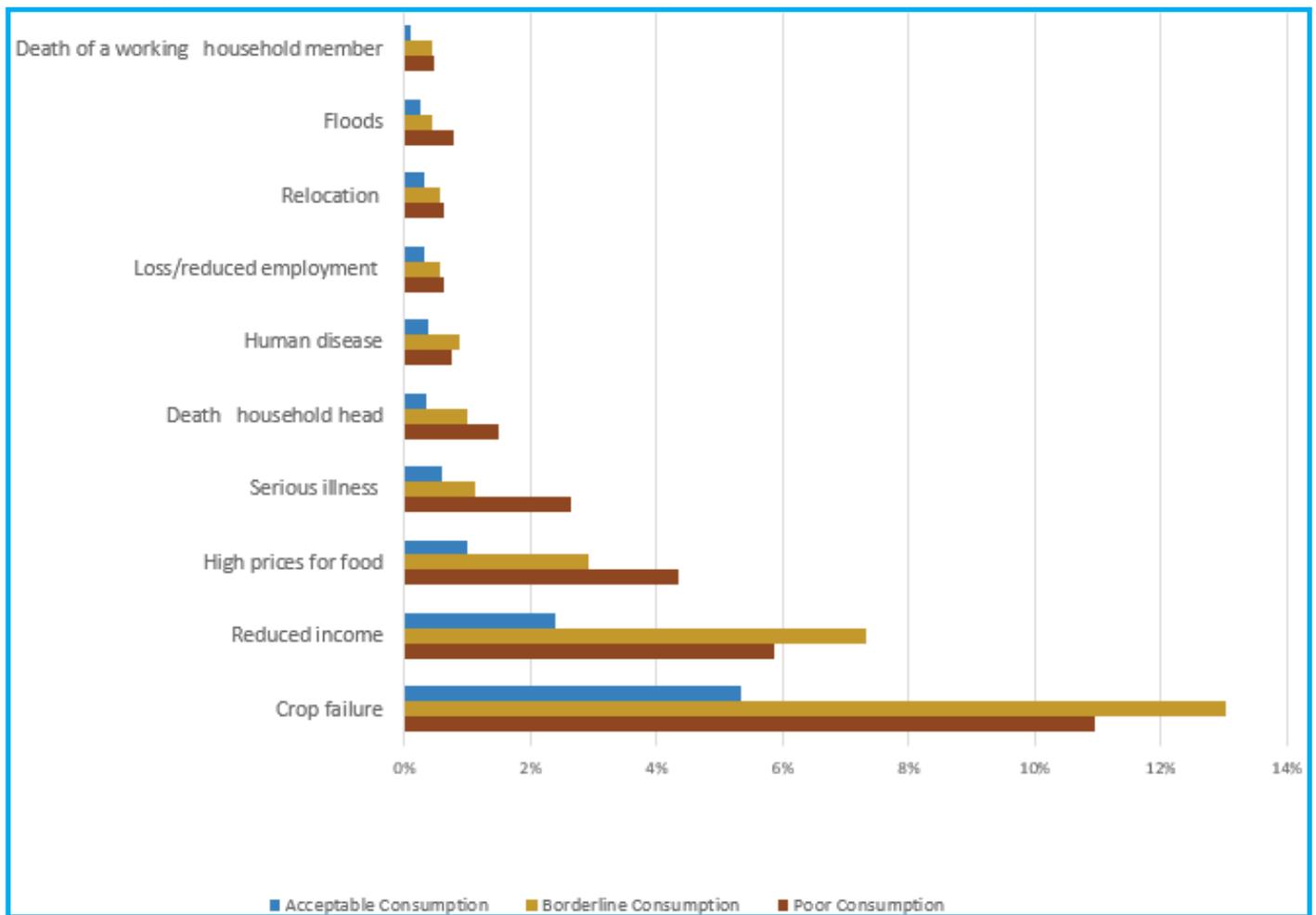
Type of economic activity/livelihood also intersects with exposure to shocks (Table 8.2). From the households that dependent on major livelihood activities; about 11 percent of crop production dependent households, 11 percent of crop and livestock mixed agriculture-dependent households, and 14 percent of casual labour/daily labour dependent households reported that they had experienced one or more shocks during the last 12 months. A high proportion of households that depend on donations from the government (53 percent), begging (51 percent) and donations from NGOs (42.5 percent) reported experiencing more than one shocks during the last 12 months. Households dependent on more precarious livelihoods, such as donation from the government and NGOs, and begging, are more vulnerable to shocks overall. Crop and livestock production livelihoods are more vulnerable to crop failure shock. Casual labourers and daily labourers were more susceptible to reduced income and unusual high price during the last 12 months prior to the date of interview, as were the service trade, including the informal sector.

Table 8.2: Livelihoods by percent of households reported more than one shocks

Livelihoods	Percent
Salary	1.3
Causal labour/Daily labour	14.2
Crop production	10.6
Livestock	6.5
Crop and Livestock (mixed agriculture)	10.9
Manufacturing, Construction, Mining	7.3
Wholesale & Retail trade - Informal Sector	6.8
Service Trade - Informal Sector	9.9
Renting of House, Land plot	18.0
Social Security (Pension, Provident fund etc.)	3.5
Remittance	9.8

Source: Computed from 2016 WMS

Coping Strategies

Nationally, the households reported five major food-based coping strategies that they employed when experiencing shocks: reliance on less preferred/less expensive foods (89 percent of households), borrowing food or reliance on help from friends or relatives (88 percent of the households), limiting portion size of meals (89 percent of households), restriction of consumption by adults in order for the small children to eat (87 percent of households) and reduction in number of meals eaten per day (89 percent of households). These strategies were mainly used to fend off the major shocks experienced during the reporting period: The major shocks were crop failure (7 percent), a reduction income a households' member (3.5 percent) and unusually high prices of food (1.5 percent) and other shocks/combination of different shocks reported by a few households (3.4 percent).

Table 8.3: Major shocks crosstab with food consumption-based coping strategies (rCS)

Shocks	Relied on less preferred, less expensive food	Borrowed food, or relied on help from a friends or relatives	Limited portion size of meals	Reduced number of meals eaten in a day	Restrict Adult consumption for children to eat
Crop failure (7%)	87%	84%	90%	82%	73%
Reduced income of a household member (3.5%)	86%	77%	87%	84%	76%
Unusually high prices for food (1.5%)	93%	83%	92%	91%	
Others (3.4 %)	79%	76%	86%	61%	

Source: Computed from 2016 WMS

Households that experienced food crop failure (7 percent):

When faced with crop failure, households employed the following strategies: limiting portion size of meals (90 percent); reliance on less preferred/ less expensive food (87 percent); reduce number of meal eaten in a day (82 percent); borrow money to buy food (84 percent) and restriction of consumption by adults in order for small children to eat (73 percent) (Table 8.3), selling higher number of livestock than usual to generate cash (21 percent), consuming seed stocks that were to be used/saved for next season (15 percent). Approximately, 15 percent, 3 percent and 19 percent of households reported that they employed stress, crisis, and emergency coping strategies during the 30 days prior to the date of interview (Table 8.4).

Households that experienced reduced income of a household member (3.5 percent):

Households experiencing a reduction in income reported reliance on less preferred/ less expensive food (86 percent); limiting portion size of meals (87 percent); reduce number of meal eaten in a day (84 percent); borrow money to buy food (77 percent) and restriction of consumption by adults in order for small children to eat (76 percent, Table 8), selling higher number of livestock than usual to generate cash (11 percent), consuming seed stocks that were to be used/saved for next season (15 percent) and borrowing money or food from a formal lender/ banker (13 percent). Nearly 7 percent, 5 percent and 22 percent of households reported that they employed stress, crisis, and emergency coping strategies during the 30 days prior to the date of interview (Table 8.4).

Households that experienced unusually high prices for food (1.5 percent):

The most common coping strategies of households experiencing unusually high prices were reducing essential non-food expenditures such as education, health and agricultural inputs to buy food (28 percent); sell more animals than usual (22 percent); selling higher number of livestock than usual to generate cash (19 percent); consuming seed stocks that were to be used/saved for next season (13percent); engage in others/not specified coping strategies(13 percent); borrow food, or rely on help from friends or relatives (12 percent), and borrowing money or food from a formal lender/ banker (12 percent). About 11 percent, 6 percent and 21 percent of households reported that they employed stress, crisis, and emergency coping strategies during the 30 days prior to the date of interview (Table 8.4).

Table 8.4: Major shocks crosstab with major summary of livelihood coping strategies/asset depletion indicators

Major shocks	No coping	Stress coping	Crisis coping	Emergency coping
Crop failure	62	15	3	19
Reduced income of a household member	66	7	5	22
Unusually high price for food	62	11	6	21

Source: Computed from 2016 WMS

Ability to Raise Cash in Case of Emergency

Households were asked if they thought they could raise Birr 300 within a week in the case of an emergency. For the households that responded they could, a follow-up question was asked how they would obtain that Birr 300. The purpose of the questions was to know whether households could quickly respond to an unforeseen emergency. The way households obtain cash for responding to emergency indicates whether the sources of cash are precarious and leading to long-term vulnerability.

Nationally, 78.5 percent of households indicated that they were capable of raising Birr 300 in a week in case of an emergency. There is slight variation among regions in the proportion of households reported that they could raise the above-indicated amount of money in a week time. However, there was almost no variation between the proportion of urban (80 percent) and rural (78 percent) households reported their capability of raising cash. In Afar, nearly 50 percent of the households reported that they could raise that amount of money within a week and it was the lowest as compared to the other regions. Harari (92.5 percent) and was a region that the highest proportion of households reported that they could raise the specified amount of cash in a week followed by Somali (91 percent).

Compared with the previous survey period (2011), there was no difference in the proportion of households reported a capability to raise cash at national, rural and urban levels. However, there is a difference at the regional level. For example, in 2011, only 67 percent of households in Addis Ababa reported having a capacity to raise cash in a week time, whereas in 2016, approximately 83 percent of the households in Addis Ababa reported the capability to raise the specified amount of cash in same period.

The first major ways the households that stated had the capability to raise cash in a week time cited were: sale of animal and animal product (25 percent), own cash (26 percent) and sales of crops (20 percent) and a loan from relatives (17 percent). The same was reported as the second major sources of raising cash in case of emergency.

The major sources of raising cash by livelihood groups show that most of the rural-based livelihoods: Crop production, livestock, mixed agriculture (crop and livestock) raise cash from sales of livestock and livestock products. About 30 percent, 66 percent, and 37 percent of the crop, livestock, and mixed agriculture livelihood

dependent households respectively stated capability to raise cash in a week time reported raising cash from sales of livestock and livestock products respectively (Table 8.5). The second major sources of cash for crop producer and mixed agriculture livelihoods was crop sales (28.3 percent and 30.4 percent each).

Most of the urban-based livelihoods, such as salary, casual/daily labourer, manufacturing, construction, mining & quarry industry, wholesale, retail and service traders, social security (pension, provident fund, etc.) and remittance mainly raise cash from own cash/ saving, and a loan from relatives.

Ability to raise cash in the event of an emergency in a week time tend to associate positively with the FCS. Nearly 81 percent of households that had reported an ability to raise cash quickly had acceptable food consumption, as compared with 64 percent of those that reported that they had no capacity to raise cash in a week time in case of emergency. Similarly, 21 percent of households that reported having the capacity to raise cash in a week time during an emergency had a high dietary diversity as compared with 9 percent of those reported that had no capacity.

Table 8.5: Strategies households employed for raising Birr 300 within a week time during time of emergency by livelihood groups

| Livelihood	Sale of livestock and livestock	Sale of crops	Sale of forest products	Own cash	Saving	Loan from bank or other institutions	Loan from relatives	Gifts from relatives	Loan from non-relatives	Equip. Edir, gifts from non-relatives	Other
Salary	2.3	0.6	0.1	59.2	13.8	1.2	12.7	1.2	6.5	1.1	1.1
Causal labour/ Daily labour	7.8	2.2	0.2	36.8	3	0.5	29.5	2.6	12.9	2.5	1
Crop production	30.2	28.3	0.7	15.5	1	0.2	17.2	1.1	2.8	3	0.1
Livestock	65.9	1.5	0.5	18.4	0.3	0	12.5	0.1	0.3	0.4	0
Crop and Livestock	36.7	30.4	0.3	10	0.5	0.4	13.6	0.8	5.9	1.4	0
Manufacturing, Construction, Mining	0.9	1.1	0	59.8	9.6	1.8	14.7	1.6	3.4	2.4	4.5
Manufacturing, Construction, Mining	8.3	1.2	0.2	46.2	2.6	0.8	30	0.8	4.8	0.5	3.6
Wholesale & Retail Trade - Informal Sector	6	1.5	0.4	60.4	3.2	0.1	18.4	1.7	6.4	1.6	0.3
Service Trade - Informal Sector	3.9	1.4	0.2	60	4.2	0.4	20.6	1.6	4.3	2.6	0.3
Renting of House, Land plot	11.1	12.1	0.1	25.3	3.7	0	33.6	6.6	4.4	0.8	2.3
Social Security (Pension, Provident fund, etc.)	2.9	0.7	0	47.9	8.7	0	25.1	6.7	5.3	1.7	0.7
Remittance	7.6	1.6	0	24.5	4.3	0.4	25.5	30.1	4.1	1.2	0.7
Average	**12.8**	**4**	**0.2**	**44.2**	**4.5**	**0.7**	**18.7**	**7.9**	**4.2**	**1.3**	**1.4**

Source: Computed from 2016 WMS

The ability to raise cash in case of emergency also positively associated with household wealth and 24.5 percent of households in the richest quintile reported that they had a capacity to raise cash whereas only 16 percent of the households in the poorest quintile. Intern associates with the income and wealth status of the households. Nearly 93 percent of households reported capability of raising cash in a week time in case of emergency were food secure whereas only about 84 percent of those reported not having the capacity to raise cash were food secure.

Perception of Food Insecurity-Food Shortage

Out of those reported that they had faced a food shortage (10.4 percent),Figure 8.1, approximately 76 percent had a shortage for one to four months and about 18 percent for five to 8 months. The majority, 52 percent had a food shortage for two to three months. Only about 2 percent of the households that reported food shortage had a shortage for nine to ten months. The proportion of households reported food shortage was higher in rural areas (12 percent) as compared to urban (5 percent).

Comparison by areas of residence in the region shows that high proportion of households in a rural area had reported having food shortage at some points during the 12 months prior to the date of interview (Figure 8.5).

Figure 8.5: Percentage of households reported a food shortage at some points during the previous 12 months
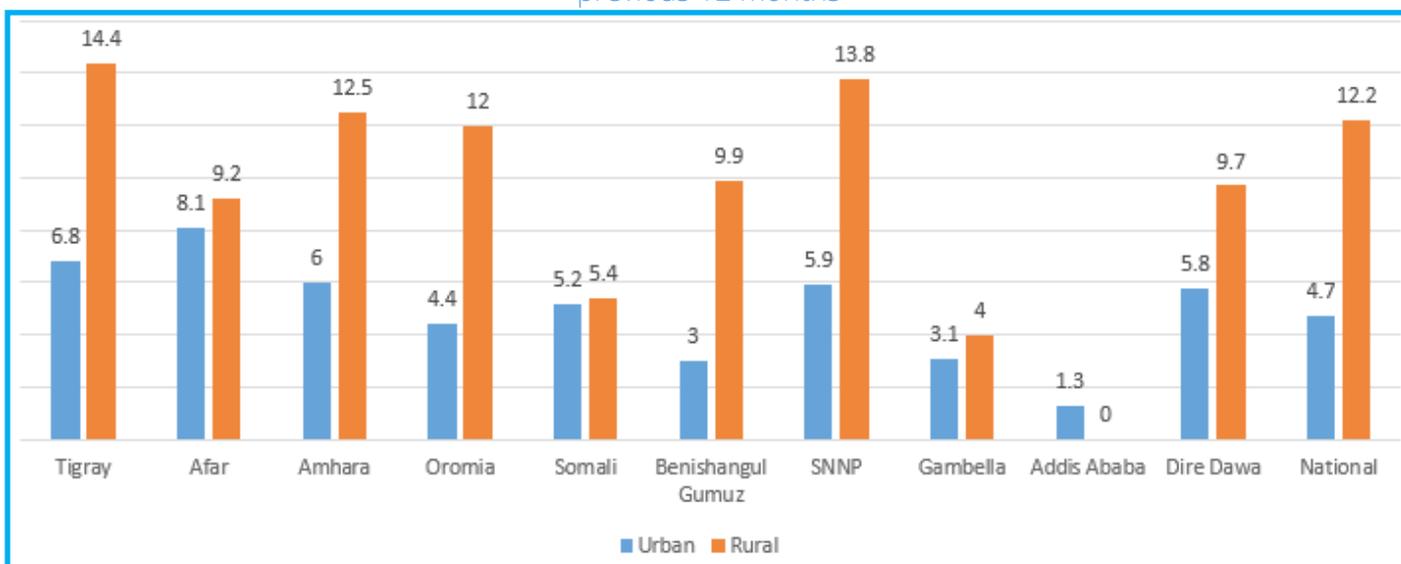

Source: Computed from 2016 WMS

About 40.5 percent households that had reported food shortage had inadequate food consumption during the seven days prior to the date of interview (a week recall period), 30.4 percent

was food poor and 41.3 had been consuming less than 2,550 Kcal per day per adult equivalent (Figure 8.6).

Figure 8.6: Percent of of households that have suffered food shortage during the last 12 months by FCG, Kcal consumed and poverty status
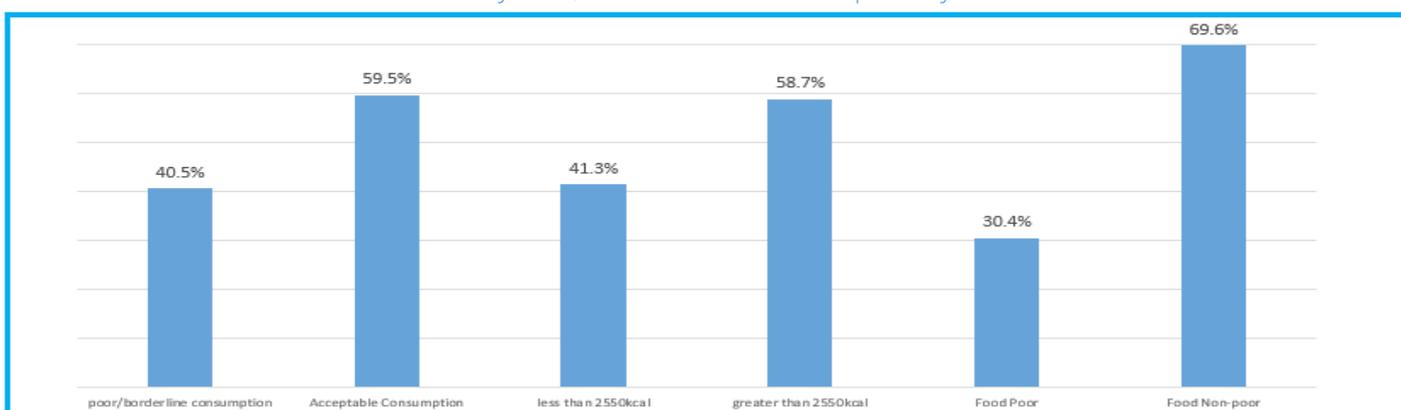
Source: Computed from 2016 WMS

# Perceptions of Food Insecurity-Change over time

Households were asked about their perception of changes in their living standards over time with respect to food as compared to the last one year and the last five years prior to the date of interview. 4.1 percent of households perceived the change in their standard of living with respect to food much worse. 23.9 percent felt their standard of living was worse, while 41.7 percent felt it remained the same as compared to the one year before. 22.4 percent of households perceived their living standards better and less than one percent felt they were doing much better than one year earlier (Figure 8.7).

As compared to the last five years, nearly 10 percent of the household nationally perceived their living standards with respect to food much worse and 19 percent perceived their living standards worse. Only 25.6 percent of households perceived their living standards as the same. A much larger percent of households perceived their living standards as higher with 28 percent of households reporting that their current living standard is better and 7.8 percent of households reporting that their current living standard much better than last five years (Figure 8.8).

Overall, 23.2 (better and much better) percent and 35.8 percent of the households perceived their living standards with respect to food was better (better and much better) during the survey than the last one year and five years, respectively (Figures 8.7 and 8.8). Approximately 28 percent of households reported that their living standards with respect to food has deteriorated as compared to the last one year and five years (worse and much worse), Table 8.7.

Figure 8.7: Change in living standards with respect to food compared with one year befor the survey (percent of households)
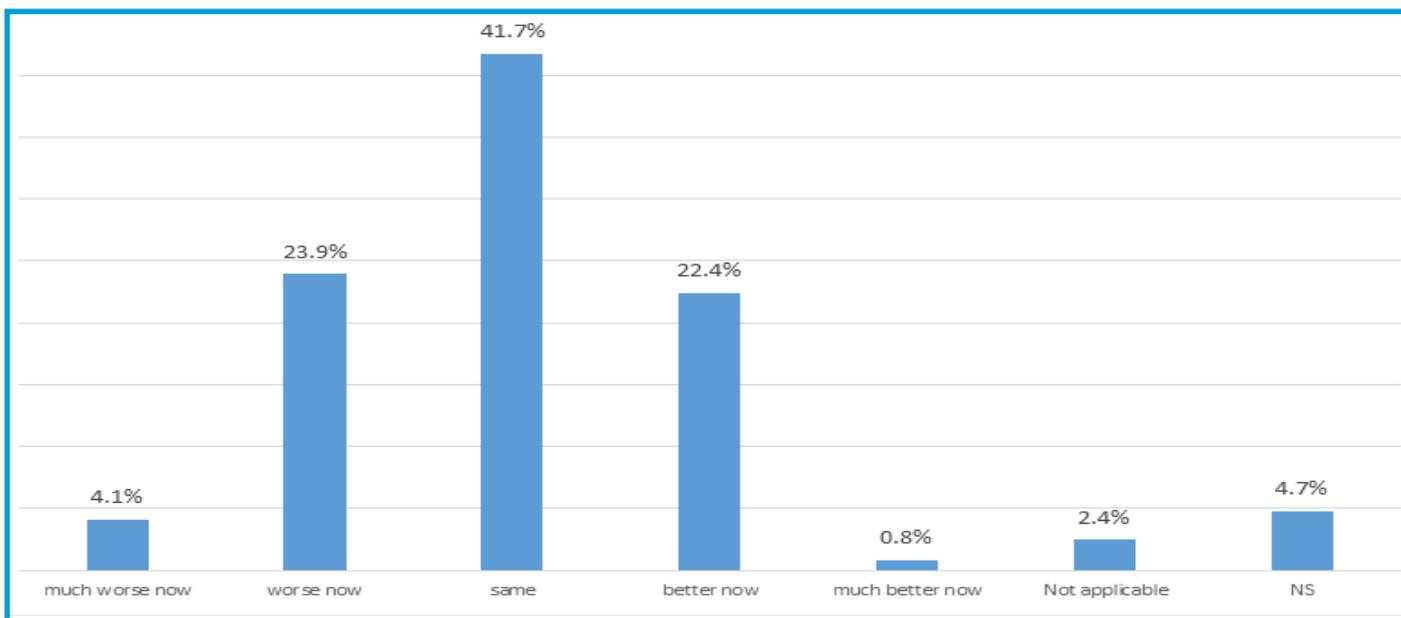
Source: Computed from 2016 WMS

Figuure 8.8: Change in living standards with respect to food compared with five years befor the survey (percent of households)
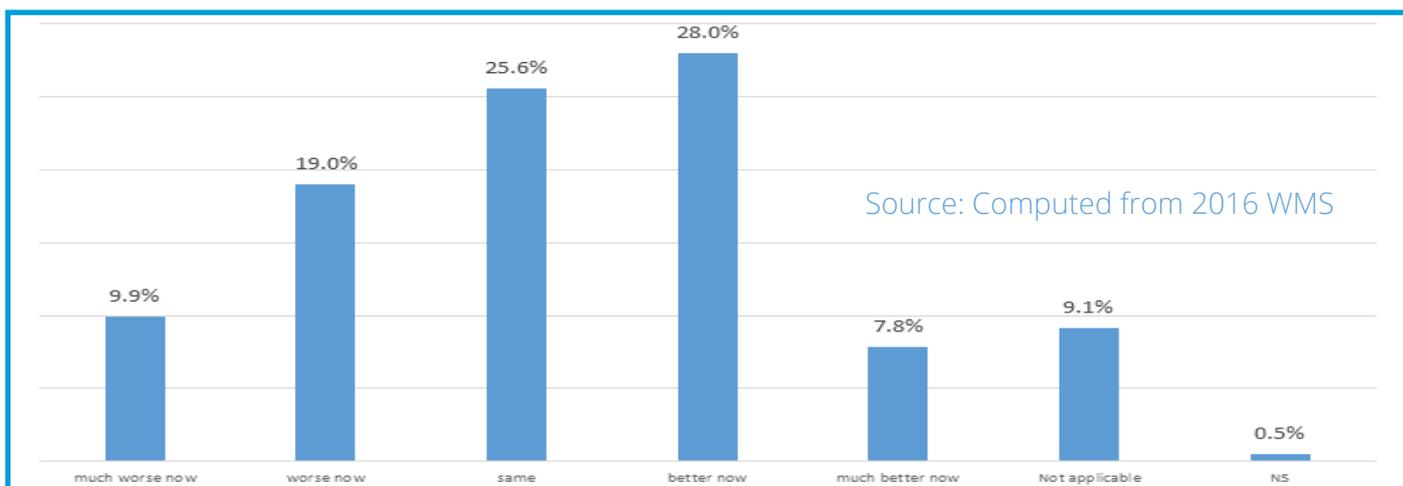

Source: Computed from 2016 WMS

Regional comparison indicated that high proportion of households in urban areas in Afar region reported that the living standards in their areas with respect to food worse during the survey period than the last one year and the last five years before the survey period (Figures 8.9 and 8.10). In the rural areas, the proportion of households that reported the living standards with respect to food much worse than the last one year and the last five years during the survey was also highest in Afar followed by Dire Dawa Administration and Amhara region. Except in Harari and Dire, higher proportion of households in rural areas of the regions perceive their living standard is the same as compared to a year before the start of the survey. In Harrai and Dire Dawa, the interviewed rural households perceive their living stands with respect to food is worse (much worse and worse) compared to a year and five years before the start of the survey. In Amhara, Tigray, Benshangul Gumuz, Oromia and SNNPR, a relatively high proportion of households in rural areas perceive their living standards much worse than five years before the start of the survey (Figures 8.11 and 8.12).

Overall, a lower proportion of households perceived that the situation during the survey period much worse than the previous one year and the previous five years as compared to the previous CFSVA which was done using the 2011 WMS and HCE survey.

Figure 8.9: Change in living standards with respect to food compared with one year befor the survey (percent of households)-Urban
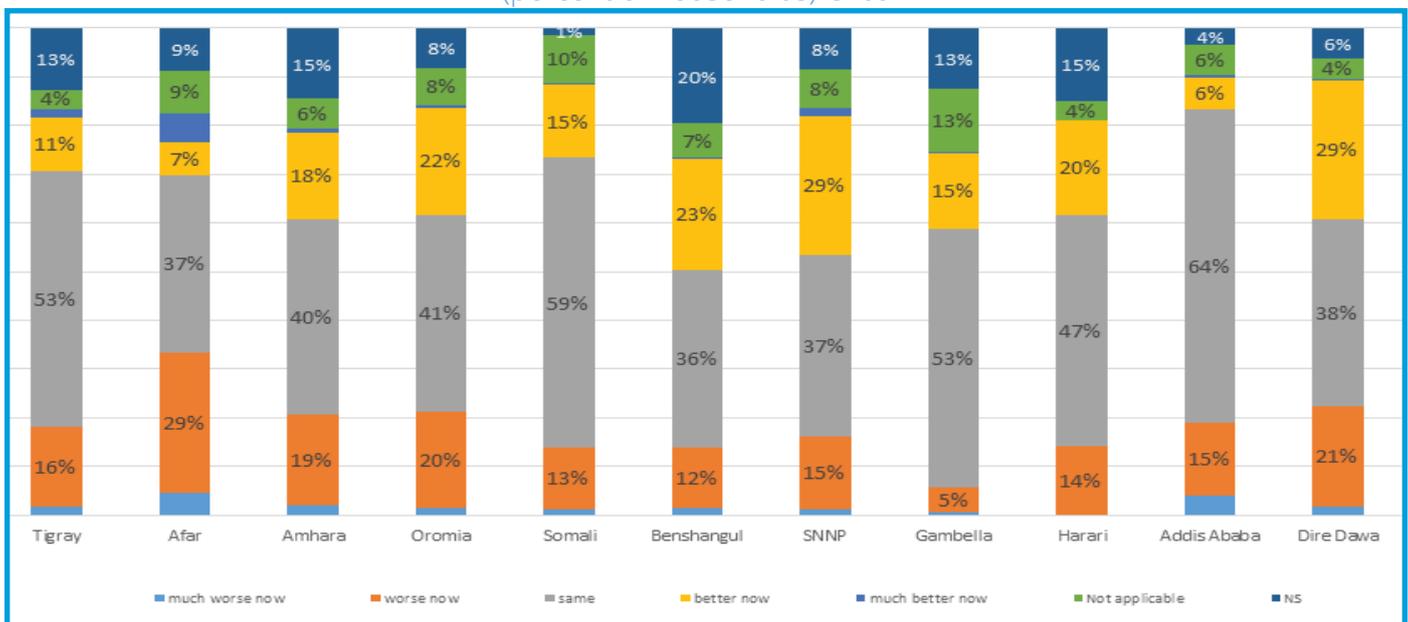

Source: Computed from 2016 WMS

Figure 8.10: Change in living standards with respect to food compared with five year befor the survey (percent of households)-Urban
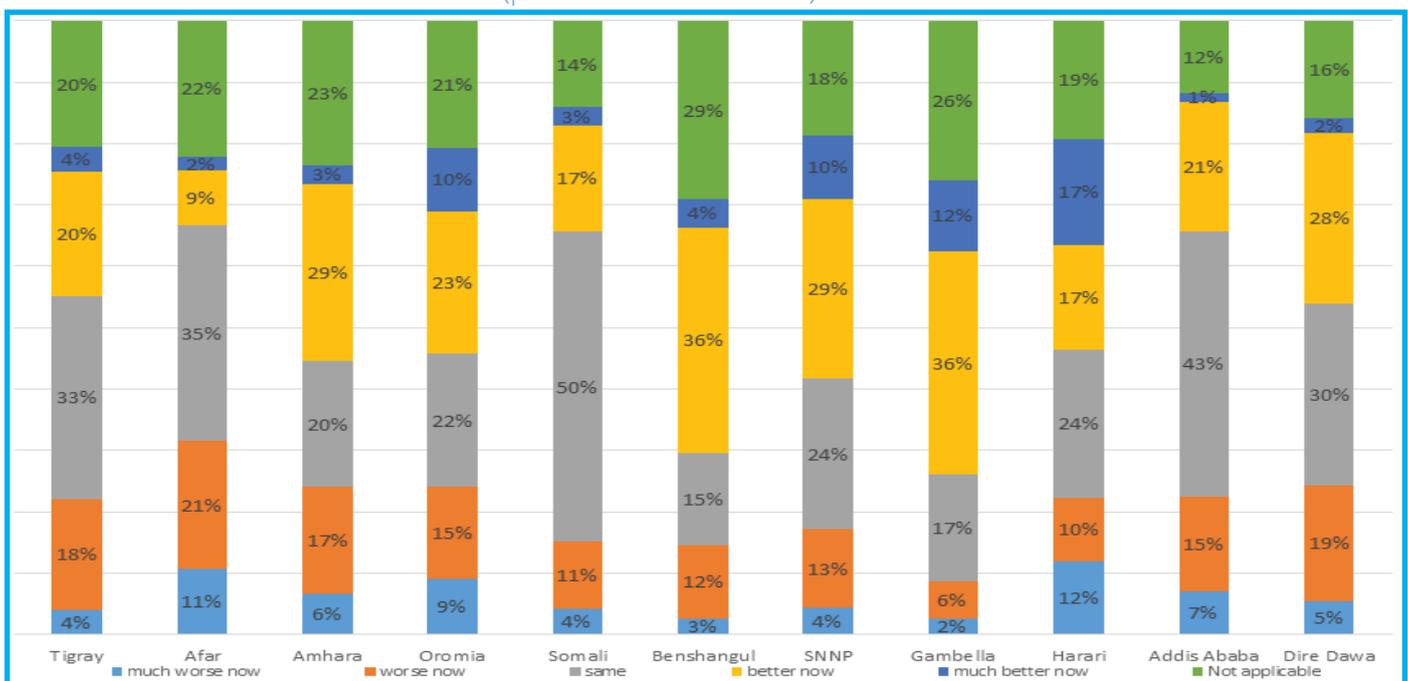

Source: Computed from 2016 WMS

Figure 8.11: Change in living standards with respect to food compared with one year befor the survey (percent of households)-Rural
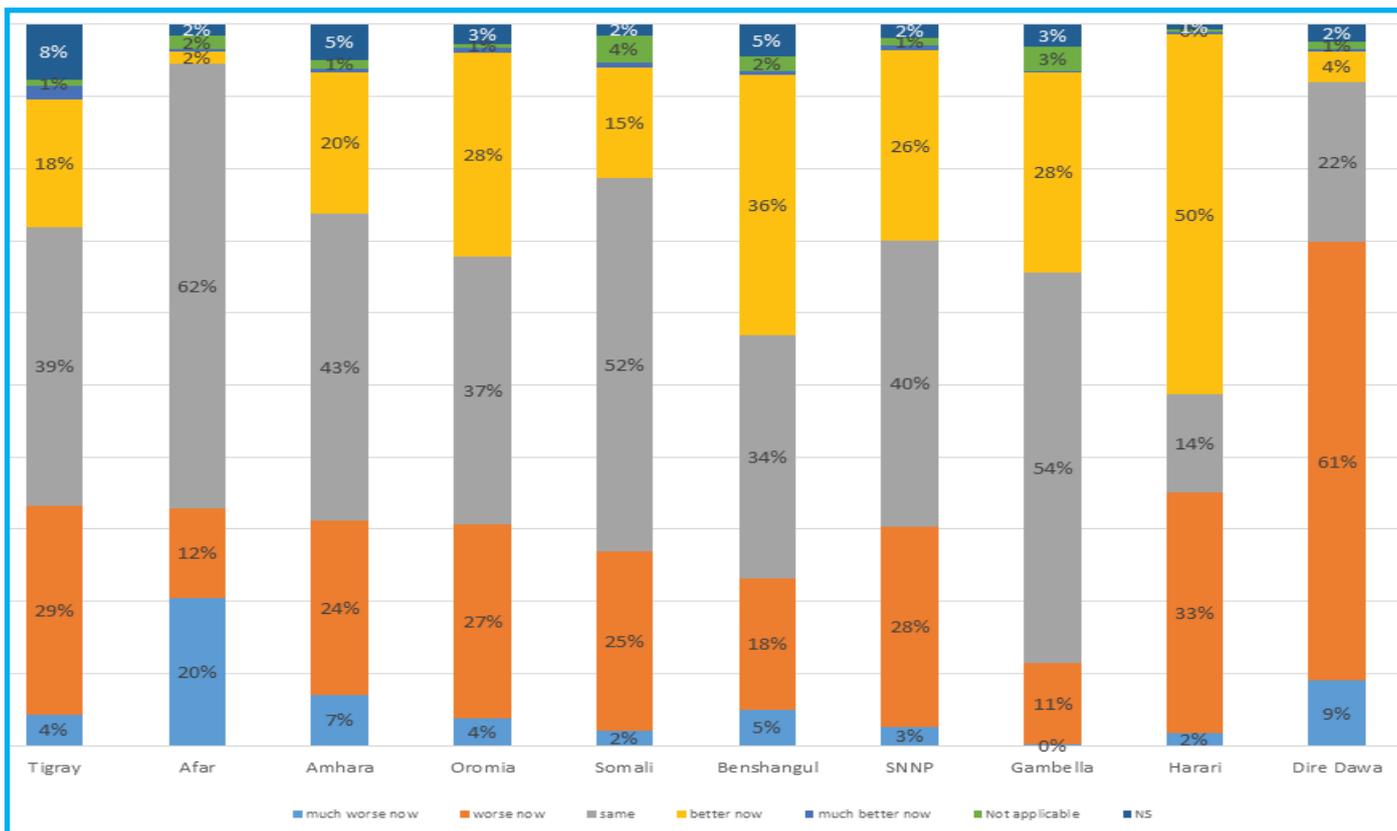
Figure 8.12: Change in living standards with respect to food compared with five year befor the survey (percent of households)-Rural
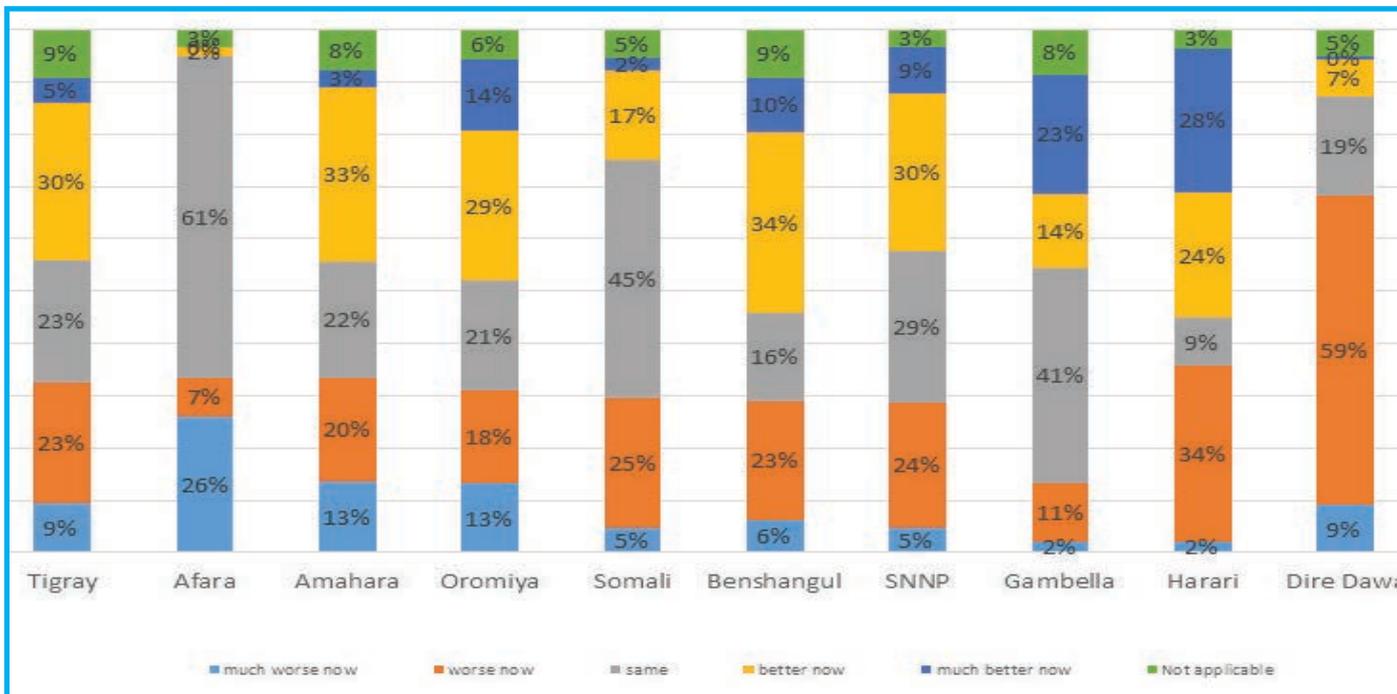
A cross tabulation of perception of food insecurity change over period of time with poverty, food consumaption score and welath index showed the proportion of households perceived food insecurity as measured by a decline in living standard over a one and five period prior to date of interview increased as households moved from non-poor to the poor (Figures 8.13 and 8.14), from the acceptable food consumption group to the poor food consumption group (Figures 8.15 and 8.16), and from the richest quintile to the poorest quintile (Figures 8.17 and 8.18). Overall the proportion of households perceive worse in food insecurity

situation over the one and the last five years was high in the poor wealth quintile, poor food consumpation group and the poorest households as comapred to the richest, acceptable food consumption group, and the noon poor households. This shows that households perception of food insecurity is positively associated with general poverty, poor welath or asset owenership and poor food consumption.

Figure 8.13: Perception of change in living standards comapred to a year before the survey period (percent of households)
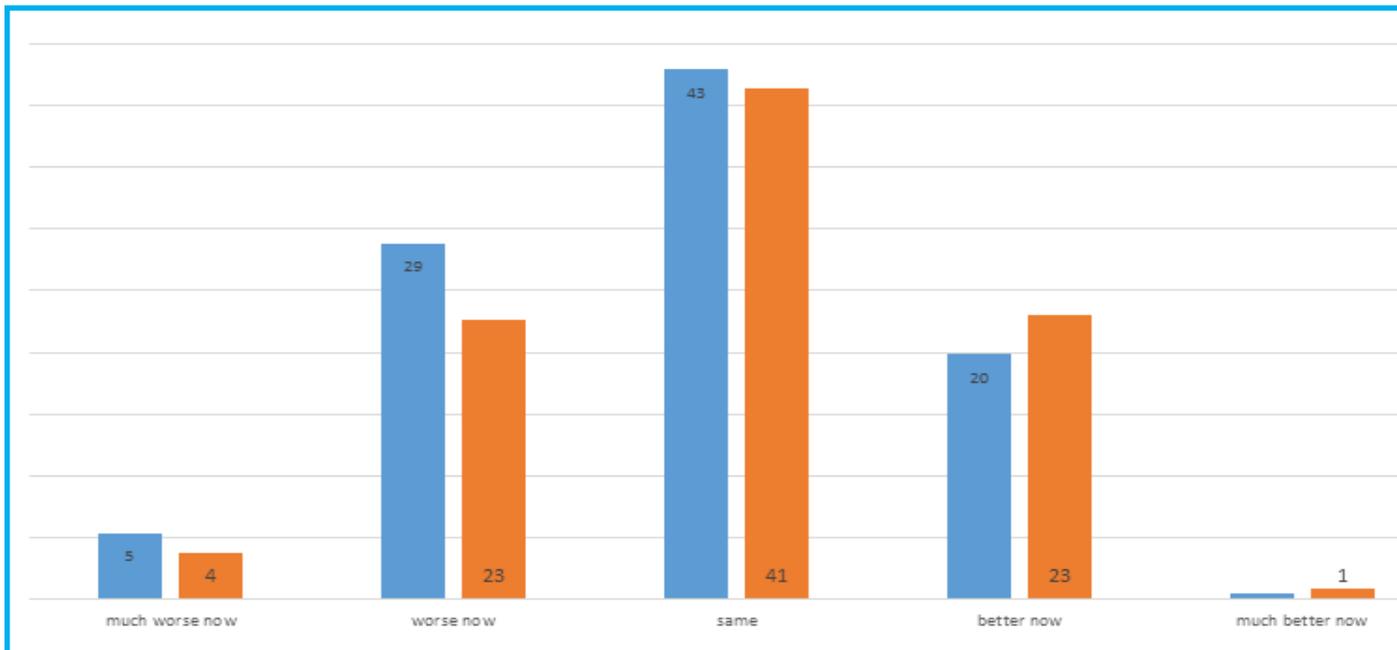
Source: Computed from 2016 WMS

Figure 8.14: Perception of change in living standards comapred to five years before the survey period (percent of households)
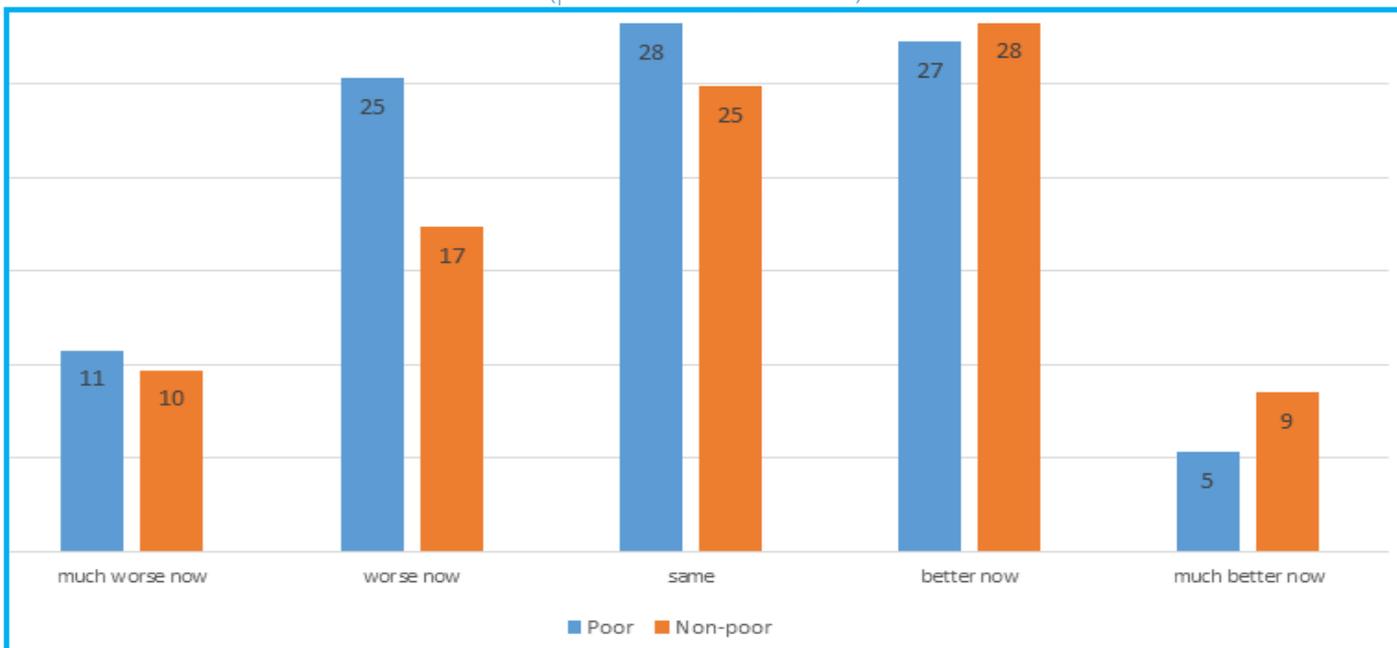
Source: Computed from 2016 WMS

Figure 8.15: Perception of change in living standards comapred to five years before the survey period (percent of households)
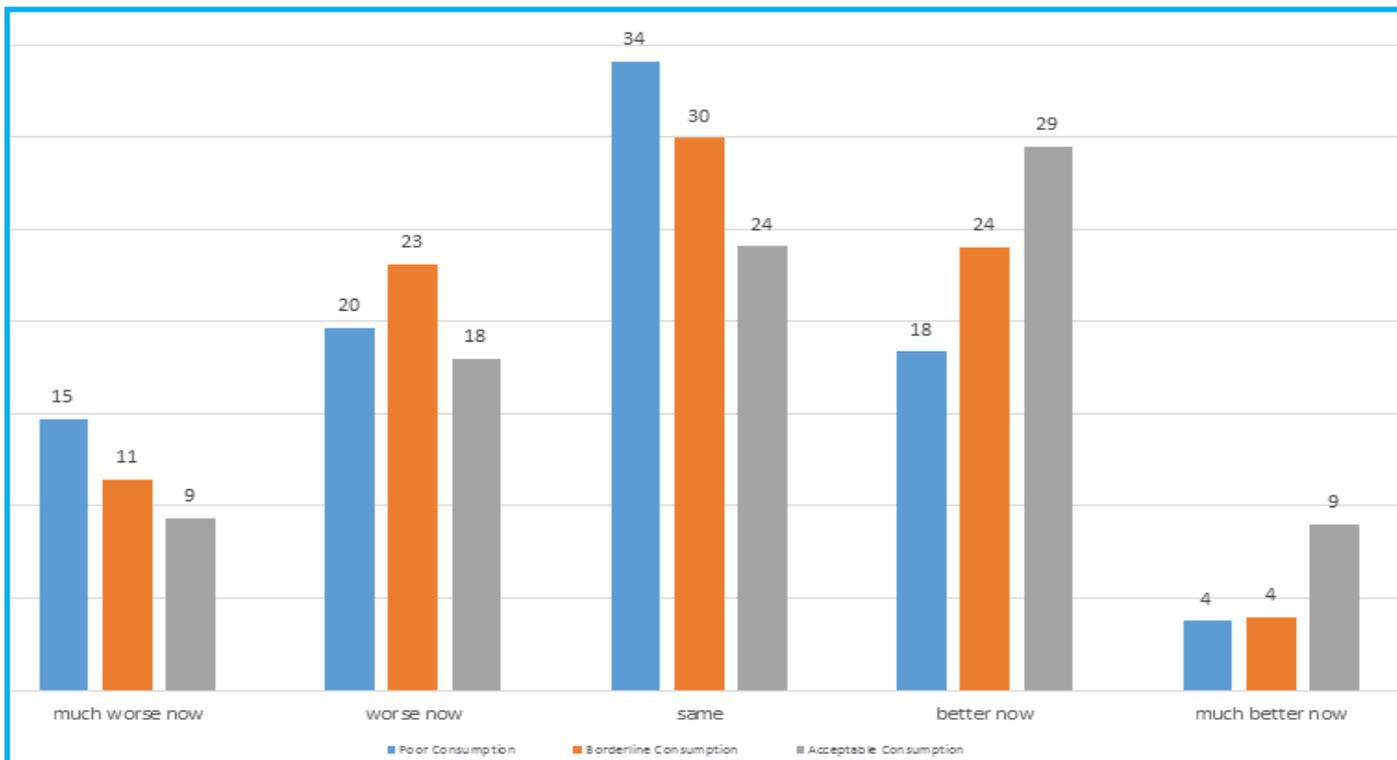
Source: Computed from 2016 WMS

Figure 8.16:Perception of change in living standards comapred to one year before the survey period (percent of households)
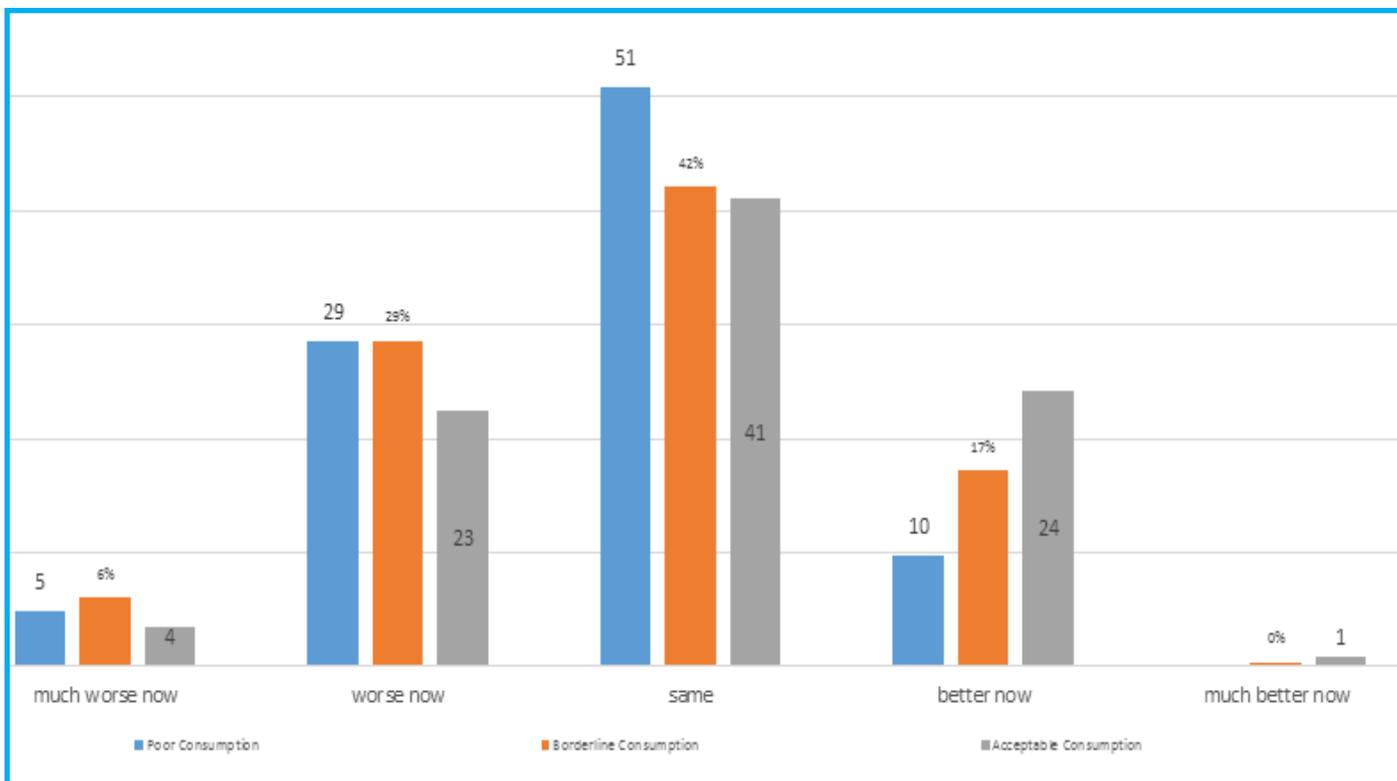
Source: Computed from 2016 WMS

Figure 8.17: Perception of change in living standards comapred to a year before the survey period (percent of households)
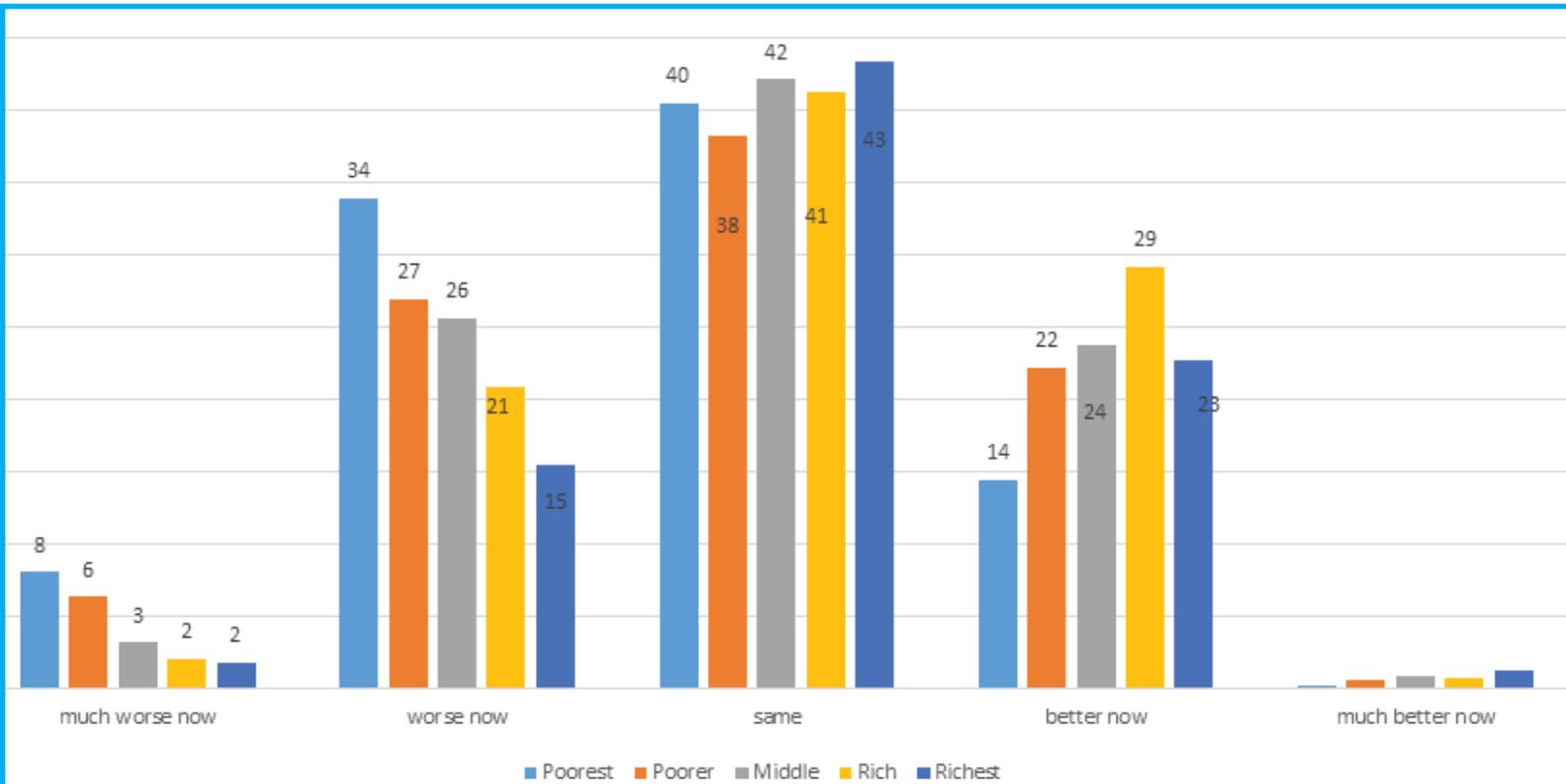
Source: Computed from 2016 WMS

Figure 8.18:Perception of change in living standards comapred to five years before the survey period (percent of households)
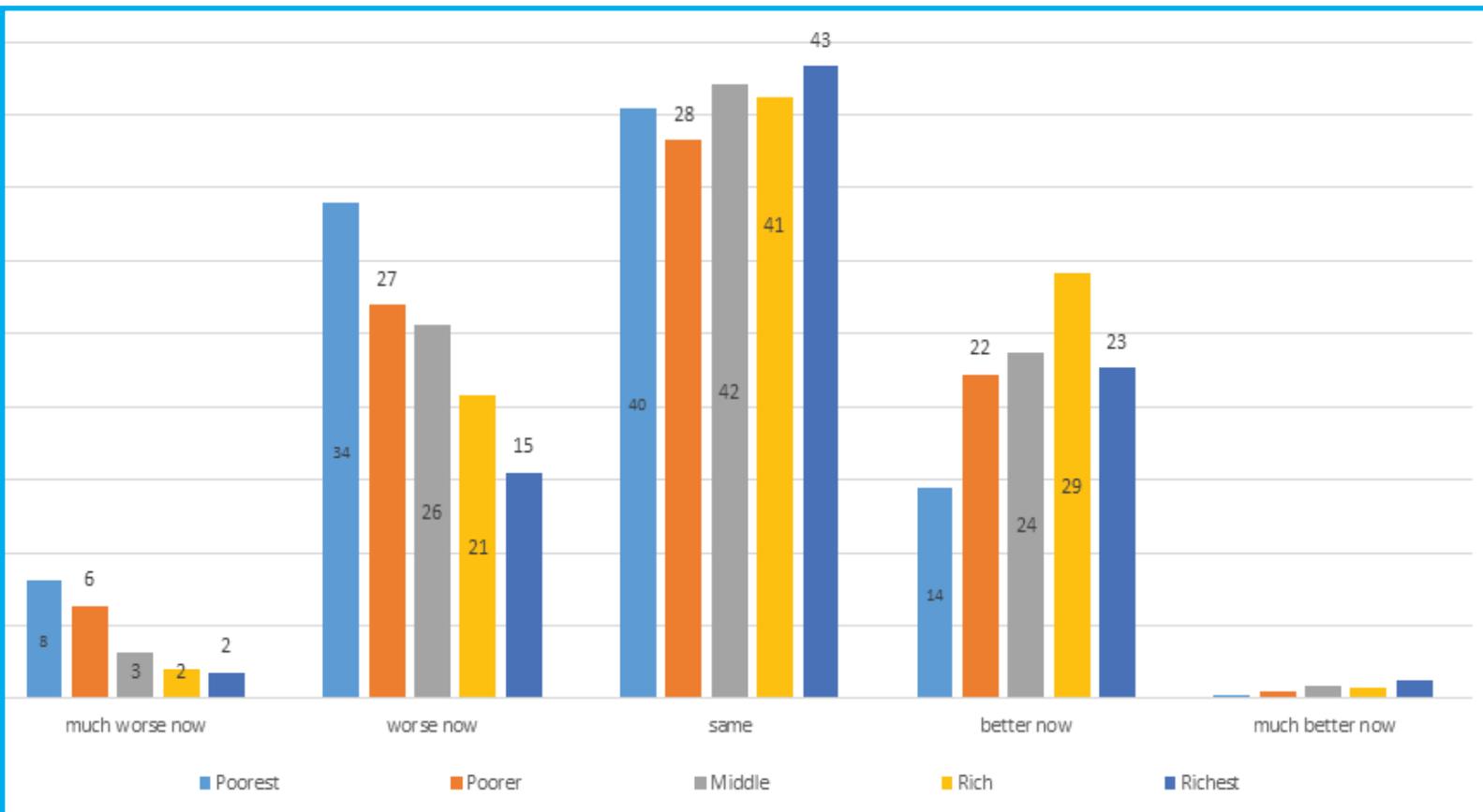
Source: Computed from 2016 WMS

SAVING
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9

WFP
World Food
Programme

Seasonality, Vulnerability, Risks and Hazards

Seasonality of food insecurity

Food security in Ethiopia is seasonal and is also affected by recurrent weather-related shocks. Agricultural production is the main source of food and income for about 80 percent of the population.   As agriculture is predominantly rain-fed, food security depends highly on the performance of the rainy seasons. Ethiopia's rainfall regime is complex due to varying topography, which includes massive highlands, semi-arid areas and desserts. Geographically, there is a wide variation in rainfall amounts, ranging from less than 250 mm to over 2000 mm. In general, the rainy seasons can be divided into three, the Kiremt or June to September rains, the Belg or February to May rains and the Bega season from October to January.

The June to September rains are the longer rainy season, where 50 to 80 percent of annual rainfall is obtained.   Most parts of the country benefit from these rains with the exception of southeastern Ethiopia (southern zones of Somali and pastoral zones of Oromia). February to May rains are generally known as the Belg season but have various names in different parts of the country. In Somali, the rains occur from late March to May and are known as the Gu and as Gena in pastoral parts of Oromia. These rains are also important for pastoralists in the South Omo Zone in SNNPR. Although the rains occurring between February to May (the Belg) have a shorter duration and are lower in amount, they are very crucial for food production and food security. First, the Gu/Gena are the main rains for most pastoralists in Somali, Oromia and south Omo Zone in SNNPR. Secondly, there are Belg crop producers, mainly in SNNPR and to some extent in the north in parts of Amhara and Tigray.

Third, the Belg rains are used to plant long cycle crops, especially maize and sorghum, which are harvested in the Meher season. As these two crops contribute to over 70 percent of cereal production, the importance of the Belg rains should not be underestimated. Unfortunately, the February to May rains are highly variable and unreliable. From October to December, pastoralists in most parts of Somali and Oromia receive their secondary rains, known as the Dyer/Hagaya rains. Figure 7.1 shows the spatial distribution of average annual rainfall.

Figure 9.1: Annual average rainfall by region
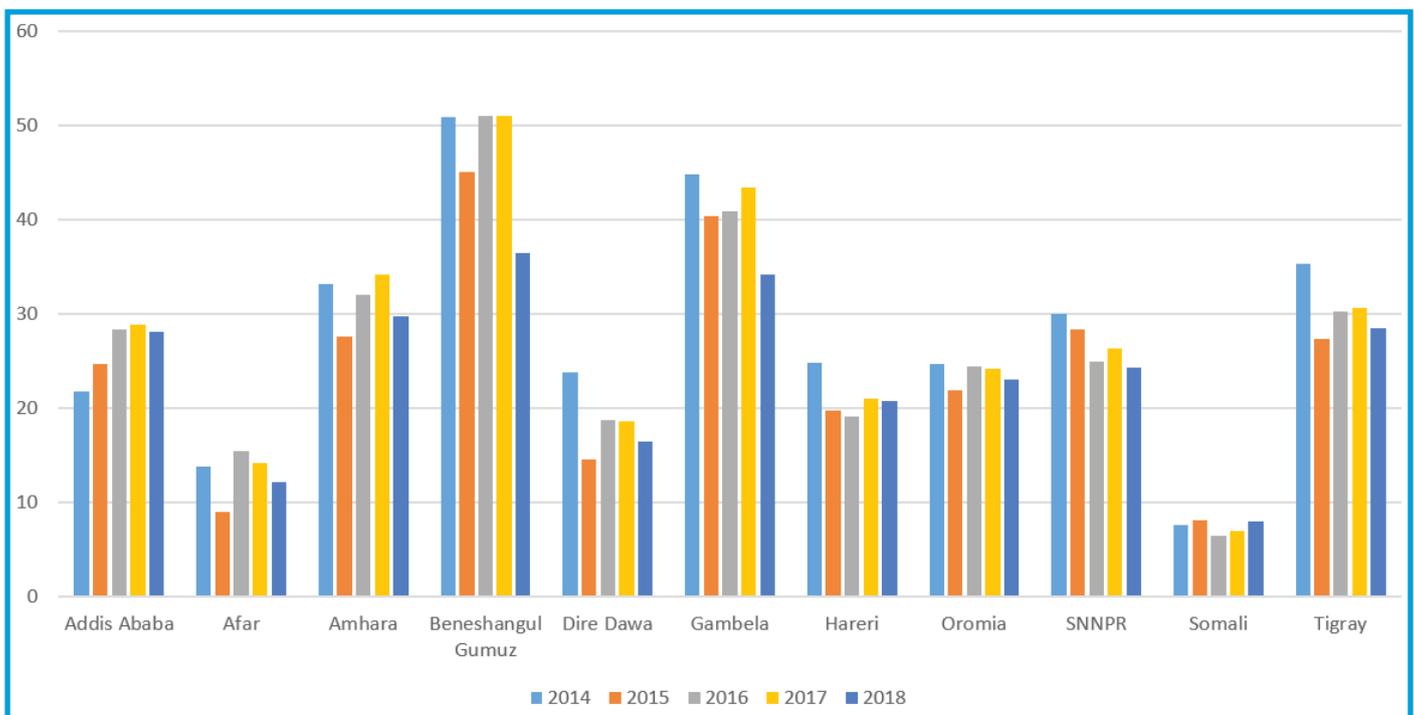
Source: LEAP

The lean season also differs depending the different rainy seasons and livelihood types. Pastoral areas face the peak of the lean season between February to mid-April, just before the start of the rains in mid-April. For Meher crop dominate areas, the main lean season is between June to September. Belg crop dominant areas have a typical lean season from April to June, just before the Belg harvest in July.

Figure 9.2: Seasonal Calendar in a typical year
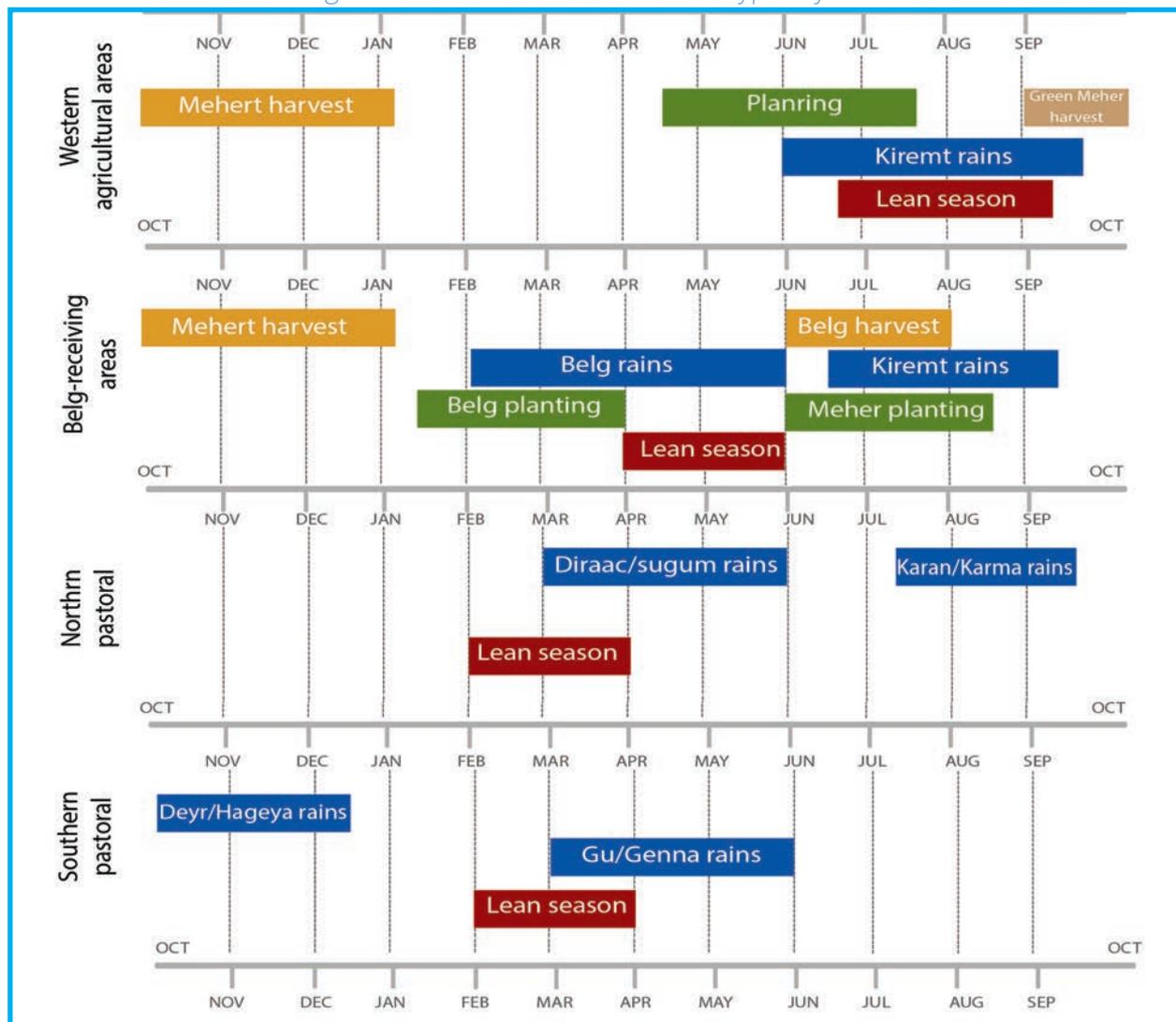
Source: LEAP

The WMS data shows self-reported food shortage at the national level peaks in July and August. There are differences in lean seasons months (as seen in Figure 7.2) depending on rainfall months and livelihood type. Food shortage reports by region confirms the seasonal calendar information, indicating that households in pastoral areas, especially in Somali, report food shortage from November to February.

Figure 9.3: : Percentage of households who reported experiencing food shortage by month (12 months prior to the survey)
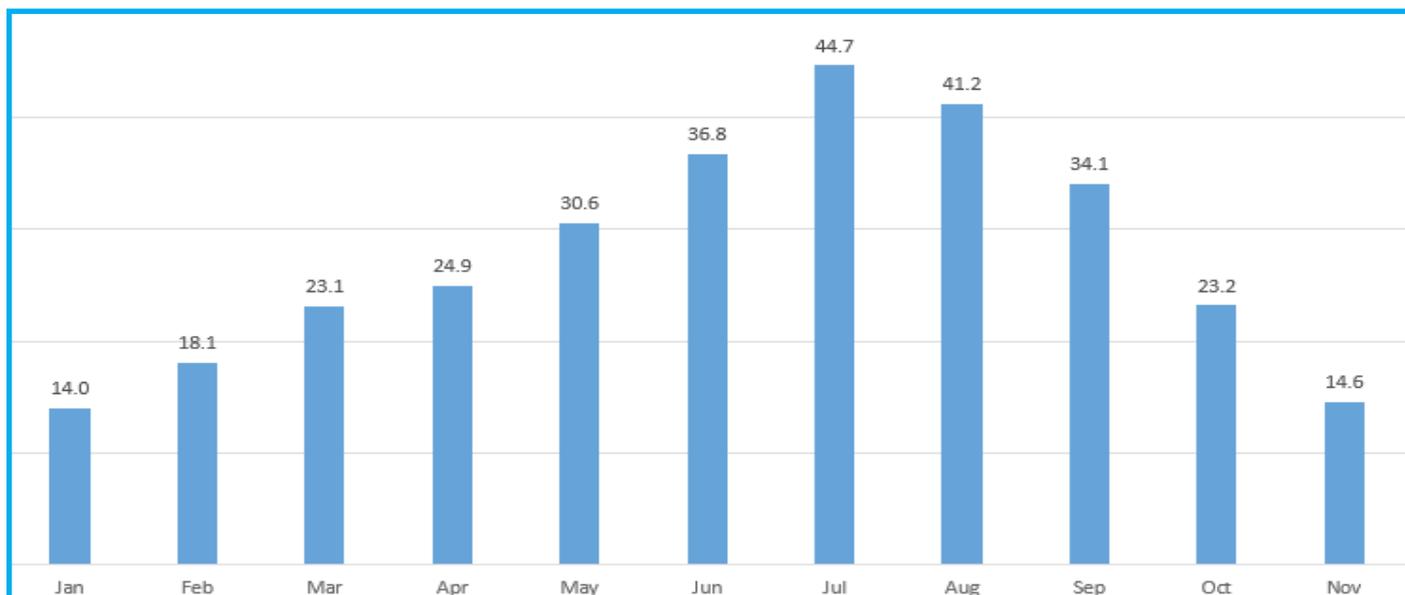
Source: Computed from WMS 2016

Climate trends

Long term stability in food security can also be examined by analyzing trends in risks and shocks. Food security in Ethiopia is affected by recurrent weather-related shocks. As seen on Figure 7.5, rainfall is variable from year to year. Declines in rainfall have been observed between March and September from 1980 to present. Both Meher and Belg rains are estimated to have decreased by 15 to 20 percent; this is particularly pronounced in the southeast and southern central parts of the country during the Belg rains.[67] Analysis of the Ethiopian National Adaptation Plan for Climate Resilient Green Economy shows rainfall variability is also high in the eastern part of the country. Not only the amount of rains, but the onset, dry spells and end times affect crop and pasture growth.

Table 9.1: Percentage of households who reported food shortage by region and month

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Tigray	2.4	2.5	2.3	2.4	2.5	3.1	6.3	7.7	11.1	11.2	8.8	4.3
Afar	1.2	1.4	2.5	2.6	2.6	2.4	2.0	2.2	0.2	0.3	0.4	0.5
Amhara	26.9	27.5	19.8	13.3	13.1	15.3	27.5	34.2	43.1	37.4	26.6	28.6
Oromia	41.5	32.6	32.9	36.6	36.4	45.9	46.6	45.1	35.1	36.9	45.2	43.5
Somali	9.1	5.1	2.9	1.7	0.6	0.5	0.5	0.5	1.8	2.3	8.0	8.5
Benishangul-Gumuz	0.3	0.2	0.2	0.2	0.3	1.1	1.3	1.5	1.1	0.8	0.8	0.4
SNNPR	17.5	29.8	38.6	42.6	43.7	30.9	14.8	8.0	6.6	9.8	8.9	12.8
Gambella	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Addis Ababa	1.1	0.9	0.7	0.5	0.6	0.4	0.5	0.5	0.7	0.9	1.1	1.0
Dire Dawa	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.4	0.3	0.3	0.4	0.3

Source: Computed from WMS 2016

Figure 9.5: Annual Average Rainfall Ethiopia
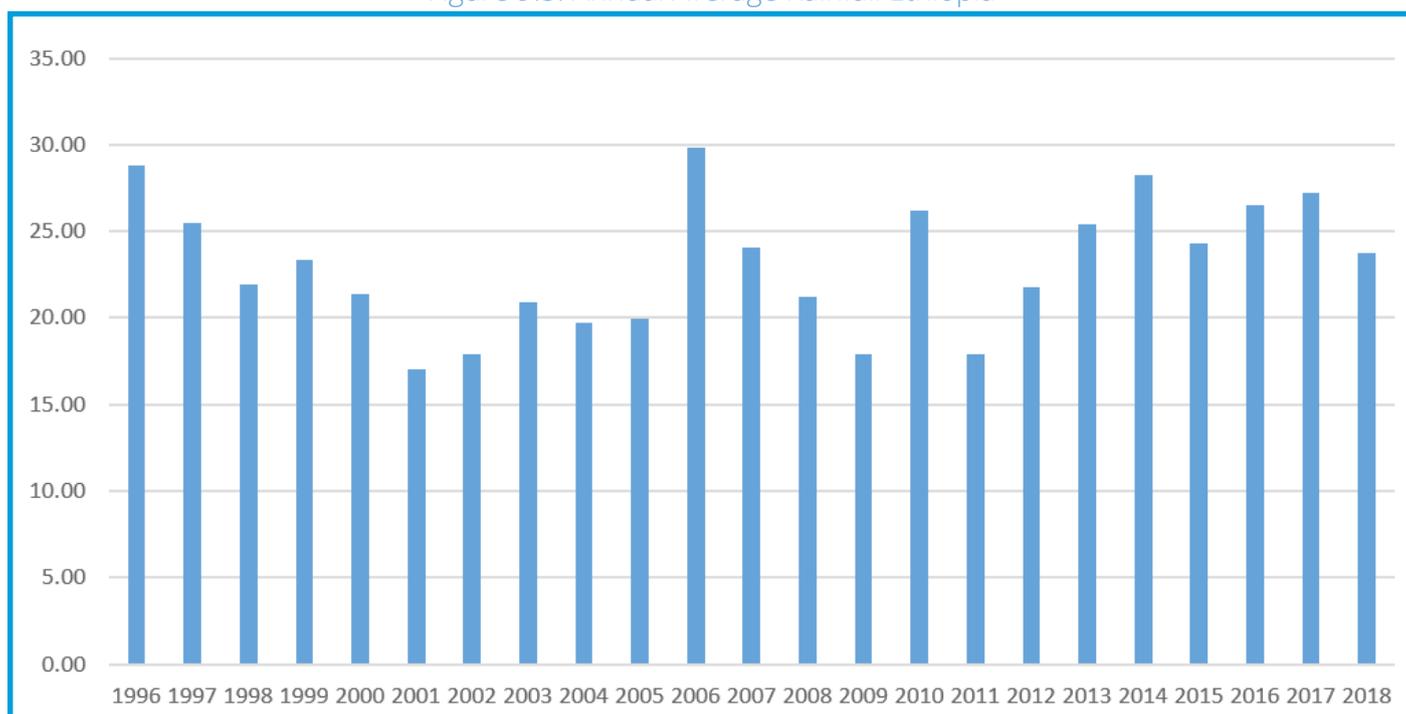
Source: LEAP

Climate impact on food security

Drought and floods are the most common climate related hazards in Ethiopia. On average, about 5 million people require emergency food assistance annually, mainly due to drought

induced food insecurity. Crop production decreased in 2015/16 following the El Niño induced drought. Climate related hazards reduce food and income in crop production areas, in agro-pastoral and pastoral areas.

Risk, Vulnerability and Hazards

Risks are uncertain events whose chances of occurring are not known in advance. It is a result of a future interplay of a hazard and the various components defining vulnerability. Risks can be idiosyncratic, that is, affecting a single person, household, or covariate, affect a group of individuals or households at the same time. The conceptual superstructure of risk shows an internal and external side (Bohle, 2001).[68] The internal side relates to the capacity to anticipate, cope with, resist and recover from the impact (vulnerability), while the external side specifies the type and intensity of the hazard. Vulnerability is the interrelation of the exposure and the susceptibility as stressor of the system with the coping capacity as the potential of the system to decrease the impact of the hazard. Exposure is defined as degree, duration and/ or extent in which a system is in contact with, or subject to, perturbation (Adger, 2006; Kasperson et al., 2005).[69]

All households face risks but differ in their ability to manage them. There are two main avenues through which household management (or lack thereof) of risks leads to deep poverty. The first is ex-ante (before risks are realized), whereby a household, which perceives its exposure to a risk to be high, will take action to reduce or mitigate the future impact of the risk. While these actions offer some insurance in the event of a shock, they come at a high price in that they lock households into activities with low productivity. The second is ex-post, whereby the household may respond to the shock by taking action that reduces its ability to respond to future economic opportunities. These responses (e.g., selling assets such as oxen

or seeds or pulling children out of school) may also deplete the household's ability to face the same or other risks in the future.

In Ethiopia, exposure to shocks, albeit economic, social, health and environmental, are the major contributing factors to the households' vulnerability to food insecurity in Ethiopia. Economic factors include food price inflation and access to market that limits households' ability to acquire enough food for health and active life. These types of shocks result in high levels of poverty (23.5 percent)[70] and limited access to different opportunity to generate income. Social factors include migration, level of literacy and conflict over resources that undermine labour and resource productivity and consequently lead to vulnerability. Environmental shocks are mainly related to recurrent drought, flood, crop loss and livestock diseases that had depleted household assets and limited coping capacity to withstand shocks.

Ethiopia is frequently and severely affected by drought, with 70 percent of the Ethiopian population at risk of disasters and climatic variability.[71] Insufficient rainfall during the 2015/16 rainy season led to severe water shortages, catastrophic livestock losses, and failed crops throughout the country, triggered by multiple consecutive seasons of below-average rainfall and the effects of the 2015/2016 El Niño climatic event. In pastoral areas, recurrent drought erodes per capita livestock size and undermined household coping capacity. An increase in pastoral drop out in Somali and Afar is an indication of the changes in livelihoods resulting from recurrent drought.

In addition to drought, populations across Ethiopia faced other challenges that contribute to sustained humanitarian needs and an ongoing complex emergency—including above-average food prices, disease outbreaks, localized intercommunal conflict, seasonal flooding, and limited access to health and water, sanitation, and hygiene services.

[67]Federal Democratic Republic of Ethiopia (2011). Ethiopia's Climate-Resilient Green Economy Green economy strateg

[68]Bohle H.-G.: Vulnerability and Criticality: Perspectves from Social Geography, IHDP Update 2/2001, Newsletter of the International Human Dimensions Programme on Global Environmental Change, 1–7, 2001

[69]Kasperson, R. E., et al. (2005). G.: Vulnerable people and places, in: Ecosystems and Human Well-being: current state and trends, Hassan, R., Scholes, R., Ash, N., 1. Island Press. Washington D.C., 143–164, 2005, cited in A conceptual vulnerability and risk framework as outline to identify. Adger, W. N.92006). Vulnerability, Glob. Environ. Change, 16, 268–281, 2006.

[70]National Planning Commission, September 2017, Ethiopia, Addis Ababa

[71]Mareile Drechsler Wolter Soer (2016). Early Warning, Early Action: The Use of Predictive Tools in Drought Response through Ethiopia's Productive Safety Net Programme. Policy Research Working Paper 7716. World bank Group
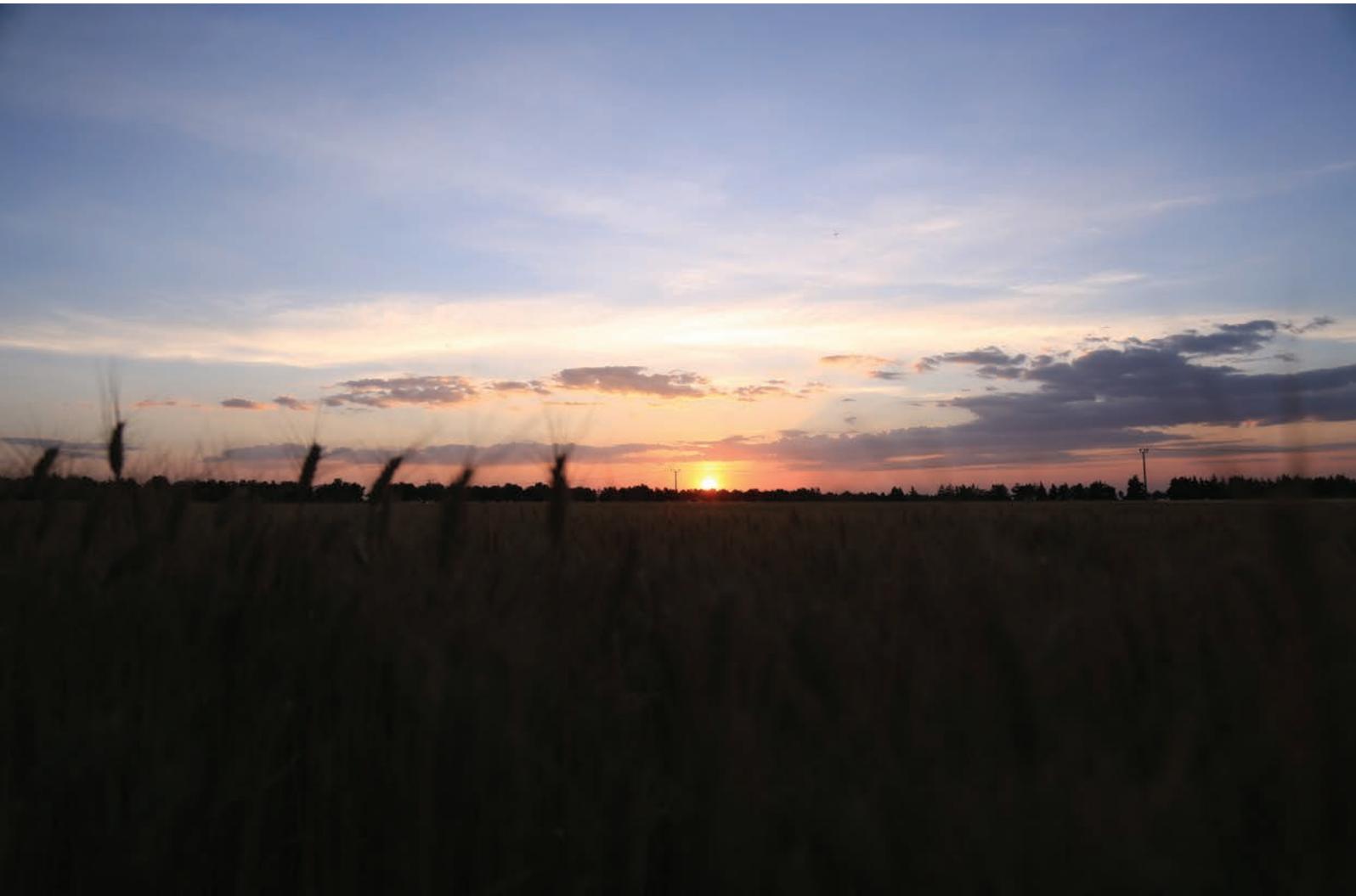
Conclusions & Recommendations

Conclusions

Food insecurity in Ethiopia has multiple causes and is related to all dimensions of food security: availability, access, utilization and stability. As such, multiple indicators and approaches have been used to examine the state of food and nutrition insecurity and the progress made to improve the situation.

A high number of Ethiopians are food insecure.

The proportion of the population who lives below the food poverty line has declined over time but is still high.   Headcount food poverty declined from 33.6 percent in 2011 to 24.8 percent in 2016, showing a 26 percent decrease over a five-year period.   This is the population whose consumption expenditure was below the food poverty line.   WFP combines different food security indicators to define food insecure households. Food energy deficiency, poverty status and livelihood coping strategies are combined to determine the food insecure. Accordingly, about 20.5 percent of households or 26 million people were estimated to be food insecure in 2015/16.   The number of the food insecure could have been higher had there not been food assistance to around 18 million people through emergency food assistance and the Productive Safety Net Programme.

On average, the quantity of food consumed per adult equivalent and calories consumed have increased considerably over time, but not for everybody.

Average energy consumption reached 3008 kilocalories per adult per day in 2015/16.   Food availability improved because of a steady increase in agricultural production and increase in purchasing power, as reflected in higher amounts of food and non-food expenditure. However, averages mask the situation of the poorer households.   Despite the overall improvement, 31 percent of the households are still consuming below the minimum calories required for their members to stay healthy and maintain regular physical activity. On the other hand, it is encouraging to note that there are wide varieties of cereals being consumed by households in different regions of the country. This provides opportunities to switch to substitute one cereal with another in case of price hike or production failure of one crop.

Diet variety which is a measure of diet quality remained very poor, despite the increase in average calorie consumption.

The share of starchy staples in total calorie consumption remained very high in 2015/16 71.4 percent which shows a highly unvaried diet. Although the consumption of vegetables, fruits, meat, poultry, fish, eggs, milk and dairy products showed a significant increase over the past two decades, it is still far below the level of consumption in most Sub Sahara African countries. This is reflected also in the complementary diet of children under five: in Ethiopia, the latter receive the least diversified diet in the entire continent (IFPRI 2018) . That is why, the starch-dominated diet is a key driver for the very high stunting in the country. Ethiopia needs to go a long way in terms of boosting availability of and access to nutritionally varied food. The per capita milk consumption in Ethiopia is around 16.6 kg per year, far below the average consumption in neighboring sub - Sharan African countries.   On average an Ethiopian adult consumes 7.5 kg of meat per year.   Pastoral and agro-pastoral regions of Somali and Afar have relatively higher per adult equivalent dairy products consumption compared to other regions. The consumption of animal products, including meat, poultry, fish, eggs, milk and dairy products, has increased 65 percent over the last two decades while consumption of pulses stagnated in a general downward trend.   But still the amount of animal protein consumption is low; the average Ethiopian adult consumes 7.5 kg of meat per year. Compared to the WHO recommendations of vegetable and fruits consumption, which is around 400g per day per person (146 kg per person per year), the average Ethiopian meet only 36.4 percent of the recommendation. However, there has been a two-fold in the quantity of fruits and vegetables consumed by an average adult from around 31 kg in 1996 to 64.4 kg in 2016.

Geographic distribution of food insecurity

shows rural households were more food insecure than urban households by all indicators except calorie deficiency. Households in rural areas had worse food consumption and were more likely to be food poor than those in urban areas. A significantly higher prevalence of malnutrition is also found in rural areas compared to urban areas.   In general, households residing in highland agro-ecology zones tended to experience higher levels of food insecurity. Comparison by region showed, Amhara region

had the highest percentage of food insecure households at 36 percent (Using WFP Consolidated Approach to Reporting Indicators), followed by Afar, 26 and Tigray 24 percent. In Somali region 15 percent of the households were food insecure according to CARI.   Amhara region also had the lowest daily kilocalorie consumption per adult on average, at 2398 kcals per adult per day (compared to national average of 3008 kcals) and the highest proportion of food energy deficient households at 55%. Afar and Tigray regions follow Amhara with high proportion of food energy deficient households at 41 ad 40 percent respectively. SNNPR had the highest kcal consumption per adult at 3558 kcals but SNNPR had the highest share of food coming from starchy staples, or a poor diet diversity.

The regions with the least proportion of food energy deficit households were Dire Dawa (8 percent), Gambella (12 percent) and SNNPR (14 percent). In contrast Amhara region had relatively better diet diversity, with only 17 % of households eating three or less food groups compared to 56 percent of households in Somali region   consuming three or less food groups. Using Food Consumption Score, a proxy for food access, SNNPR had the highest proportion of households (46 percent) with inadequate consumption, that is poor and borderline consumption followed by Afar (30 percent) and national average of 23 percent.

Drivers of food insecurity

Food insecurity is usually related to poverty since chronic food insecurity is caused by the inability of households to produce, purchase or to have access to food. According to this analysis, income and assets were found to be key determinants of food insecurity.   About 75 percent of the income poor households were unable to meet the cost of buying the number of calories enough to meet recommended daily calorie requirements. Only 7 percent of the income non-poor households were unable to meet daily calorie requirements. All food security indicators improve with wealth, and the measure of food poverty improves most dramatically.   Income and asset poor households were also over represented in the food insecure category compared to the non-poor households in both FCS and CARI.   Equally important are the underlying factors of shocks, such as droughts, rainfall variability with uneven rainfall distribution. In terms of livelihood, food insecurity is relatively high among households engaged in informal sector, mixed agriculture, and casual labor.   Demographic factors also were important drivers of food insecurity. Larger

household size and lower educational attainment of the household head are significantly associated with household food insecurity.

Recommendations

Based on the findings of this analysis and in particular the profiles of the 26 million food insecure people, the following are made to improve the food security and reduce vulnerability of the food insecure. In general, resources and assistance should be targeted according to the level and dimension of food and nutrition insecurity.   More specific recommendations are listed below.

Programme Recommendations

Livelihood Promotion

• Promote alternative, nutrition sensitive livelihood development programs providing more stable sources of income and develop and diversify livelihood opportunities.

• Strengthen regulations to support services like index insurance

• Support productivity at the household level through efforts such as increased small-scale irrigation and improve storage capacity and food processing technology, applying specific approaches which preserve the micronutrients in the final product.

• Increase nutrition sensitive safety nets and pro-poor growth initiatives tailored to specific needs in urban and rural areas, to promote income generation and asset acquisition.

• Promote activities including bee-keeping, sheep and goat fattening, poultry, vegetable and fruit production and consumption and raising and planting tree seedlings as income generating opportunities for smallholder farmers.

Nutrition-sensitive interventions

• Sensitize households to consume a greater portion of the nutritious food they already produce (egg, fruits, vegetables, fruits, milk, etc.) to address social behaviors and eating habits.

- Advocate for better child nutrition, encouraging   a higher diversity of food items consumed and a higher frequency of meals. Promote the availability and accessibility to diverse, safe, and nutrient dense food items required for proper child nutrition.

- Efforts to increase the nutritional content of food items consumed, through nutrition education and increased accessibility of food rich in nutrients, with a focus on food rich in proteins and iron. This may include expansion of varieties of bio-fortified nutrient-rich crops including high-iron beans, quality protein maize, etc.

- Ensure that non-nutrition specific programming such as livelihoods, climate change, school feeding, and most of all social protection include a nutrition-sensitive component: at least one nutrition sensitive outcome, objective and indicator.

Expansion of Services

- Improve rural infrastructure development to increase the accessibility of services such as markets that promote the production and commercialization of valuable foods.

- Promote basic adult literacy classes for illiterate men and women, good agriculture and land management practices, business skills such as financial literacy, basic accounting, and cooperative/business management

- Promote the application of population policy and family planning packages.

- Design and expand social safety net, index insurances, mandatory saving and establish social scheme through co-funding

- Continue to scale up and implement seasonal interventions to help households experiencing seasonal food insecurity and ensure that transfer programs take seasonal peaks of food insecurity into account.

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Annex

Food Items	Tigray		Afar		Amhara		Oromia		Somali		Benishangul Gumuz		SNNPR		Gambella		Harari		Addis Ababa		Dire Dawa		National	
	Kg	% Share	Kg	% Share	Kg	% Share	Kg	% Share	Kg	% Share	Kg	% Share	Kg	% Share	Kg	% Share	Kg	% Share	Kg	% Share	Kg	% Share	Kg	% Share
Teff	45.8	13.3	19.2	5.1	35.6	10.6	45.8	10.1	1.9	0.5	22.6	6.2	30.1	4.5	36.5	7.4	45.6	11.4	114.6	32.3	43.4	11.2	39.6	8.8
Wheat	37.1	10.8	92.7	24.8	25.3	7.5	32.4	7.1	59.0	16.8	3.5	0.9	15.3	2.3	5.7	1.2	15.8	4.0	2.6	0.7	31.9	8.2	28.6	6.4
Barley	12.5	3.6	0.9	0.2	10.4	3.1	15.7	3.5	0.1	0.0	0.4	0.1	5.2	0.8	1.2	0.2	0.8	0.2	2.0	0.6	1.5	0.4	10.2	2.3
Maize	18.5	5.4	80.3	21.5	31.9	9.5	81.0	17.8	41.0	11.7	55.9	15.2	113.0	16.9	164.3	33.3	27.0	6.8	1.2	0.3	22.3	5.8	66.7	14.8
Sorghum	68.2	19.8	4.1	1.1	37.5	11.1	29.2	6.4	33.8	9.6	70.8	19.3	9.7	1.4	16.7	3.4	64.8	16.3	0.3	0.1	38.9	10.0	28.8	6.4
Other cereals	5.1	1.5	7.2	1.9	14.2	4.2	9.6	2.1	35.9	10.2	28.4	7.7	3.3	0.5	9.4	1.9	15.5	3.9	7.2	2.0	20.4	5.3	10.8	2.4
Processed Cereals	9.1	2.7	14.2	3.8	3.9	1.2	7.6	1.7	38.7	11.0	7.5	2.1	6.2	0.9	11.6	2.4	48.7	12.2	39.2	11.1	61.2	15.8	10.0	2.2
All Cereals	196.4	57.1	218.5	58.4	158.8	47.1	221.3	48.7	210.3	60.0	189.1	51.5	182.8	27.4	245.4	49.7	218.2	54.8	167.0	47.2	219.5	56.6	194.8	43.2
Pulses	17.2	5.0	9.3	2.5	22.5	6.7	21.7	4.8	5.3	1.5	28.6	7.8	20.8	3.1	12.0	2.4	8.2	2.1	19.4	5.5	9.4	2.4	20.1	4.5
Oil seeds	0.2	0.1	0.2	0.0	0.3	0.1	0.3	0.1	0.0	0.0	0.6	0.2	0.0	0.0	0.1	0.0	0.6	0.2	0.1	0.0	0.0	0.0	0.2	0.0
Meat	13.4	3.9	3.5	0.9	6.4	1.9	5.8	1.3	3.4	1.0	5.1	1.4	10.6	1.6	7.6	1.5	8.9	2.2	12.4	3.5	5.6	1.4	7.4	1.6
Milk/Diary products	7.2	2.1	94.8	25.3	6.0	1.8	24.6	5.4	57.2	16.3	8.7	2.4	16.4	2.5	54.5	11.0	29.1	7.3	9.3	2.6	11.9	3.1	20.1	4.5
Other animal products (egg, fish, etc.)	0.9	0.3	0.3	0.1	0.2	0.1	0.5	0.1	0.0	0.0	0.6	0.2	0.5	0.1	18.1	3.7	1.1	0.3	2.0	0.6	1.0	0.3	0.6	0.1
Root Crops	4.8	1.4	3.0	0.8	29.0	8.6	73.0	16.1	4.2	1.2	15.0	4.1	274.9	41.2	22.7	4.6	30.1	7.5	23.5	6.6	21.7	5.6	90.5	20.1
Spices	5.6	1.6	2.7	0.7	7.7	2.3	4.3	1.0	1.5	0.4	5.5	1.5	4.4	0.7	3.0	0.6	2.1	0.5	6.8	1.9	2.4	0.6	5.1	1.1
Sugar/Sweeteners	4.7	1.4	11.7	3.1	4.0	1.2	6.8	1.5	37.9	10.8	5.0	1.4	2.7	0.4	9.5	1.9	12.3	3.1	9.5	2.7	14.1	3.6	7.2	1.6
Oils and fats	7.2	2.1	6.9	1.9	7.0	2.1	9.2	2.0	13.1	3.7	8.9	2.4	6.7	1.0	10.5	2.1	14.0	3.5	16.4	4.6	18.5	4.8	8.6	1.9
Vegetables	31.9	9.3	21.6	5.8	25.1	7.4	67.0	14.8	16.0	4.6	51.8	14.1	112.7	16.9	87.9	17.8	64.8	16.3	77.3	21.8	79.0	20.4	60.9	13.5
Fruits	10.2	3.0	1.3	0.3	1.2	0.3	2.8	0.6	1.1	0.3	6.3	1.7	5.9	0.9	12.3	2.5	4.0	1.0	5.3	1.5	2.9	0.8	3.5	0.8
Other foods	44.1	12.8	0.5	0.1	68.9	20.5	17.1	3.8	0.2	0.1	42.2	11.5	29.6	4.4	10.6	2.1	4.8	1.2	5.2	1.5	1.6	0.4	31.6	7.0
Total	147.5	42.9	155.8	41.6	178.3	52.9	233.0	51.3	140.0	40.0	178.3	48.5	485.2	72.6	248.7	50.3	180.1	45.2	187.2	52.9	168.4	43.4	255.8	56.8

Source: Computed from HCES 2015/16

Annex 2: Average daily Calorie intake per adult equivalent by source and Region, 2016

Source of Calorie	Tigray Cal.	Tigray % share	Afar Cal.	Afar % share	Amhara Cal.	Amhara % share	Oromia Cal.	Oromia % share	Somali Cal.	Somali % share	Benshangul Gumuz Cal.	Benshangul Gumuz % share	SNNPR Cal.	SNNPR % share	Gambella Cal.	Gambella % share	Harari Cal.	Harari % share	Addis Ababa Cal.	Addis Ababa % share	Dire Dawa Cal.	Dire Dawa % share	National Cal.	National % share
Teff	439	16	137	5	337	14	428	14	14	0	210	8	242	7	275	8	366	12	975	38	306	10	358	12
Wheat	355	13	870	31	246	10	319	10	568	19	33	1	152	4	56	2	157	5	23	1	315	10	279	9
Barley	124	5	8	0	102	4	155	5	1	0	4	0	47	1	11	0	8	0	18	1	13	0	99	3
Maize	164	6	786	28	267	11	721	23	364	12	477	17	1005	28	1575	48	263	8	10	0	217	7	591	20
Sorghum	689	25	41	1	373	16	295	9	325	11	716	26	97	3	168	5	651	21	3	0	392	13	288	10
Other cereals	49	2	59	2	137	6	92	3	350	12	269	10	28	1	70	2	152	5	57	2	197	7	103	3
Processed Cereals	79	3	129	5	34	1	68	2	357	12	67	2	53	2	114	3	428	14	324	12	533	18	89	3
Cereal Total	1899	70	2030	71	1495	62	2078	66	1978	67	1776	64	1624	46	2268	69	2025	66	1410	54	1973	65	1808	60
Pulses	164	6	89	3	211	9	191	6	47	2	262	9	180	5	111	3	80	3	188	7	86	3	181	6
Oilseeds	2	0	2	0	4	0	4	0	0	0	8	0	0	0	1	0	9	0	1	0	1	0	3	0
Meat	34	1	8	0	16	1	15	0	7	0	13	0	29	1	19	1	24	1	31	1	14	0	19	1
Milk/Diary products	12	0	175	6	15	1	74	2	109	4	35	1	50	1	116	4	62	2	34	1	24	1	54	2
Other animal products (egg, fish, etc)	4	0	1	0	1	0	2	0	0	0	2	0	2	0	68	2	4	0	8	0	4	0	2	0
Root Crops	9	0	6	0	53	2	241	8	8	0	30	1	1117	31	87	3	54	2	44	2	39	1	328	11
Spices	55	2	27	1	74	3	39	1	13	0	52	2	35	1	28	1	21	1	66	3	24	1	47	2
Sugar/Sweeteners	48	2	113	4	23	1	52	2	399	13	40	1	17	0	65	2	112	4	100	4	148	5	61	2
Oils and fats	177	7	170	6	172	7	227	7	322	11	219	8	164	5	256	8	344	11	402	15	455	15	211	7
Vegetables	37	1	27	1	32	1	64	2	19	1	57	2	87	2	74	2	72	2	97	4	88	3	58	2
Fruits	15	1	5	0	2	0	3	0	3	0	7	0	9	0	14	0	6	0	7	0	3	0	5	0
Soft drinks and Packed Juices	2	0	91	3	5	0	6	0	1	0	4	0	9	0	8	0	8	0	8	0	3	0	7	0
Alcoholic Beverages	151	6	98	3	136	6	136	4	51	2	171	6	160	5	160	5	257	8	183	7	151	5	139	5
Other foods	98	4	1	0	156	6	39	1	1	0	95	3	63	2	28	1	13	0	12	0	4	0	71	2
Total	2707	100	2844	100	2393	100	3171	100	2957	100	2772	100	3547	100	3304	100	3091	100	2592	100	3016	100	2993	100

Source: Computed from HCES 2015/16

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World Food
Programme

Contributors

World Food Pogram Ethiopian Office

- ▷ *Alemtsehai Alemu*   *(alemtsehai.alemu@wfp.org)*

- ▷ *Mamo Getahun*   *(mamo.getahun@wfp.org)*

- ▷ *Tsegazeab Bezabih*   *(tsegazeab.bezabih@wfp.org)*

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