

*Article*

# Food Security Condition of Smallholding Farmers in Kilte Awelalo, Ethiopia

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**Abstract:** Food is one of the basic necessities for all living things in this globe to grow, maintain life and develop. It is a source of energy for almost all bodily functions and it directly affects our health status and how we feel each day and the future. Yet, there are millions of people around the globe who do not have the sumptuousness to provide enough food to themselves and their beloved ones. Ethiopia is one of the highly food insecure countries in the world, it's name has been illustrious for famine and drought for decades. The study's main aim is to assess the livelihood resources and strategies of the smallholding farmers in their strive to achieve food security at household level. For this particular study, from Tigray region, Kilte Awelalo was taken as a study area and three Tabias were selected; Ayenalem, Genfel and Tahetay Adikesanded. The total sample number of households from these three Tabias was 370 and a formal interview schedule was employed to collect relevant primary inputs for the study. The study found that farmland holding size and its fertility as major impacting factors behind the livelihood strategies and food security condition of the smallholding farmers. It was also found that about one third of the total sample population were chronically food insecure, whereas about half of the population were transitory food insecure and rest very little number of households were food secure.

**Keywords:** food security, rural livelihoods

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## Introduction

Globally, the figures of undernourishment has shown a significant decline where currently there are about 795 million people who are undernourished. Currently there are numerous people

who are affected by hunger in developing nations and the number of hungry people is still growing by a rate of four million per year and the trend is not falling as quickly as predicted to achieve the goal predominantly in Africa and Southern Asia. For developing nations as a whole, the total share of undernourished people in the total population has declined from 23.3% in 1990-92 to 12.9%. A pronounced decline in number of undernourished was perceived majorly from developing nations despite the significant population growth<sup>4</sup>. Africa in general showed a slow progress towards achieving international hunger targets as the region is highly influenced by natural disasters and conflicts. The continent continues to be the region with the highest prevalence of undernourishment with an average of one in four people out of a billion are estimated to be undernourished.

The Sub-Saharan Africa has the highest prevalence of undernourishment though there has been seen a betterment in the last two decades. Undernourishment has declined from 32.7% to 24.8% in 2014. The five countries in Africa with the highest undernourishment are Ethiopia, Tanzania, Nigeria, Kenya and finally Uganda<sup>2</sup>. Ethiopia is frequently affected by food deficits where on average 5 million people require food aid each year. Additional to this, due to El-nino impact, the number of population who are in need of direct food aid has increased to 15 million (Federal Democratic Republic of Ethiopia, 2015). Since the 1980s, the country was able to enhance grain productivity by 70% yet in parallel the total population grew from 40 to 99.1 million and will further increase by 31 million in the coming 15 years. Coupled with this, low land fertility and low fertilizer adoption, disease epidemic and other factors led to a high variability in the agricultural productivity, predominantly in the smallholdings. FAO (2015) affirmed that economic growth is a key success factor for reducing hunger which basically focuses on the livelihoods of the poor and as thus improving the productivity and income generating activities of smallholder farmers is a key to its progress<sup>4</sup>.

Ethiopian economy basically depend on agriculture and the sector contributes the lion share of the Gross Domestic Product (GDP) and foreign currency earnings of the country through sale of agricultural outputs abroad. Furthermore, the sector is creating employment opportunities to the majority of the country's population and presently about 85% of the total population depends on agriculture to sustain their basic livelihood. Consequently, as the sector had been backbone of the Ethiopian economy for centuries in the past, still continues to be the leading at present and it is

believed to remain the determinant sector to play a dominant role in bringing an overall sustainable economic growth to the country<sup>3</sup>.

Moreover, food security has been given an enormous emphasis by the Government of Ethiopia and various strategies and programs were implemented in this regard. Yet, the country's overall figure regarding food security trend has been very low though remarkable progress was made by different governmental and nongovernmental stakeholders. This part of the study explains the background characteristics of the surveyed sample household heads and their food security condition through their food intake behavior by different measurement techniques. It presents results of descriptive analysis of the study by using data gathered from 370 respondents. The descriptive analysis is done to portray the general characteristics and nature of the socio-economic condition and to analyze food security status of smallholder farmers. To assess food security conditions of the smallholding farmers, the study employed Food Consumption Score (FCS), Months of Adequate Household Food Provisioning (MAHFP) and Body Mass Index (BMI) as proxy measures. In concomitant to this, various independent variables were also incorporated accordingly to their significance echelon on food security condition in the study areas.

Smallholder agriculture is the most important sector of Ethiopia's economy and other developing countries. About 80 percent of the population lives in the rural areas having a main source of income from agriculture. The agricultural sector contributes for about 45 percent of the GDP, almost 90 percent of the country's exports and 85 percent of employment (MOARD, 2010). However, the sector remains dominated by subsistence, low input-output rain fed farming system in which droughts periodically reverse performance gains with devastating effects on household food security and poverty levels<sup>1</sup>.

Despite the ample attention to the agricultural sector in the country's development plans since the 1970s till the recent undertaking Five Year Growth and Transformation Plan, yet achieving food security is still a major problem in Ethiopia. Ethiopia is among the poorest and most food insecure countries of the world where 38% of its population live below the national poverty line<sup>10</sup>; and 37 % of the rural population live below the national food poverty line in 2011<sup>6</sup>. Efforts by politicians and researchers to make effective food security strategies have been constrained by a lack of reliable and relevant information concerning the causes of food insecurity.

As a result, interventions have too often become inappropriate that fail to consider the actual facts. This has created a gap between major determinants of food and livelihood security, and areas of interventions by government to achieve it.

In 2002, Regional Food Security Strategy was designed in different regions of the country including Tigray, Amhara, Oromia, and the Southern Nations, Nationalities and People (SNNP). In Tigray, under conservation-based agricultural development policy, the food security strategy designed in 2002 was an integrated approach. It aimed at ensuring food security and environmental rehabilitation in the region. Furthermore, the study gave a big emphasis to the rural part of Ethiopia mainly for the reason that the majority of the population as well as the most disadvantaged and food insecure segments of the population live in.

Studies revealed that, with the exception of direct food aid, the success stories in recent periods over food security are results of various interventions. Interventions targeting extension services and productive safety net had a positive effect on the food security of households while direct food aid had insignificant impact on household food security in Tigray<sup>7</sup>. Similar studies also revealed that in order to investigate the effectiveness of government policy interventions addressed in improving food security in Tigray region, food self-sufficiency has improved both at the regional and district level. As the study shows, food deficit has declined by 32 percent over the time period and the self-sufficiency ratio (SSR), which is measured as the ratio of the sum of net production of cereals to the requirement of food, has shown an increase of 8.6 percent<sup>9</sup>.

In spite of these improvements over the recent periods, still 31 *Woredas* are food insecure out of 34 *Woredas* in the region in 2008 according to Tigray bureau of agriculture. Most studies conducted so far in the field give more emphasis to the macro level food production, consumption and deficit problems which shows the crude national and regional picture of the country. There is a core gap in the assessment methods in assessing food security, mainly by employing Calorie Deprivation Indicators such as measuring individual level and difficulties in collecting relevant information especially in cases of rural farming households. Yet, another study revealed that in many countries it appears to be found that very low or no correlation between calorie deprivation and food security outcomes, also reached the same conclusions in Ethiopia<sup>5</sup>.

In concomitant to the above, there are hundreds of studies made in this vicinity for diverse purposes reminiscent of academic fulfillment, government and non-government office researches and others. However, apart from few isolated case studies, most of them have abandoned the subject matter that household/individual level food security should not be alienated from the livelihood strategies on those particular premises of study for better sympathetic. Moreover, research which cannot delineate accordingly to local based clarifications as its foundation for recommendation, revealing numbers and figures would just be presenting a progress report. Studies subject to baseline surveys, have limitations of raising the local sounds which should have been a base for concluding remarks. With this in mind, the issue of Food and livelihood security should be integrated basing to that specific area, to reach for a substantiated results which could be obliging for identification of new or better ways and areas of intervention for different interested stakeholders.

This research is therefore, an attempt to fill the existing gaps on food and livelihood security, and hence, identifying and describing those factors which contribute for food and livelihood insecurity in Kilde Awelalo is the main concern of the study. Research undertakings in such issues at household level are essential since the results may possibly give a spot of light to development planners in order to combat food and livelihood insecurity and vulnerability at household level.

### **Research Methods**

The areas selected for this study are found in the Regional State of Tigray, which is located in the northern part of Ethiopia. From the region Kelete Awelalo Woreda commonly known as Wukro was selected and three Tabias were selected; Ayenalem, Genfel and Tahetay Adikesanded. The main considerations made for taking the above listed study areas are; first, areas selected are highly drought prone areas where in the past few years the food insecurity the livelihood struggles in these areas revealed that households in these areas are either chronically or temporally food insecure with limited livelihood options. Secondly, the areas selected for the study are suitable in different facilities like weather (agro ecology) variability among the three, transportation and safety security for conducting the research from highly food insecure areas in the Woreda.

## SAMPLING TECHNIQUE

When the sampling design is in place, the sample size will be determined. The three 'Kushets' have a total of 4,826 households (HHs); Ayenalem 1,966 households, Genfel 1,605 households and Tahetay Adikesanded 1,255 households. There are several ways of determining the sample size and for this study the researcher used a simple formula from Yamane to determine the sample size. The formula is depicted as follows;

$n = \frac{N}{1+N(e)^2}$  where, n is sample size , N is total population and e is level of precision

$$n = \frac{4,826}{1 + 4,826(0.05)^2}$$

$$\underline{n \approx 370}$$

*≈ 7.65% of the total population*

**Table 1.** Number of selected 'Kushets' and samples

No.	Kushets	Number of Households	Samples
1	Ayenalem	1,966	151
2	Genfel	1,605	123
3	Tahetay Adikesanded	1,255	96
	Total	4,826	370

**Source:** Own calculation, 2015

## Data Sources, Type and Method of Collection

Throughout the study both primary and secondary sources of data which included both quantitative and qualitative types were used to generate a valuable and relevant information. A common consensus has been established recently that mixed qualitative and quantitative research studies provide more robust and useful findings. For the primary data collection, a structured interview schedule was administered to 370 households and alongside an interview was conducted for Woreda Food Security Task Force committee (WFSTF) and Development Agents (DA's); 3 WFSTF's and 3 Development Agents. In addition to this, interview was further conducted with

local Kushet (Community) representatives; 6 representatives and 2 Regional Food Security and Early Warning coordinators.

Regarding secondary data, the study used different secondary data information where they are appropriate, materials such as officially published and unpublished materials from various governmental and non-governmental organizations, baseline surveys of the region, Ministry of Agriculture and rural development bulletins, different bulletins and etc.

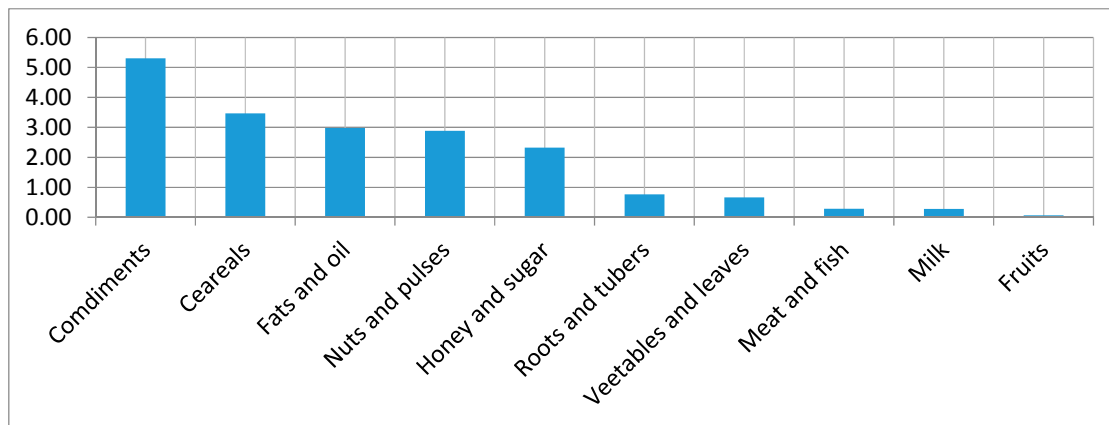
## **Results and Discussion**

The respondents were composed of both female and male headed households where the majority are male headed households 313 (84.6%) and it was found that majority of the household heads are in the age group of '55 and above' followed by middle age group of '35-44'. In a small-scale agriculture, majority of the job demands more physical force and in case of the study areas, the socio-cultural attitude towards female farmers/cultivators do not encourage women to engage in various agricultural works. It is also found that about 56.4% of the total sample household heads had no formal education and 99.8% are Christians.

The study found that majority of the respondents (33.5%) in the study areas produce two varieties of crops in a given year out of which 67.7% of them own farmland and from farmers who do not own a cultivable farm land, majority produce on average 1-2 types of crops. The major types of crops that farmers grow in the study areas include in descending order are wheat, *Teff*, and finally sorghum produced by 73.9%, 73.9%, and 20.7% of the households respectively. The major cash crops produced in the study areas include onion by 14.8% of households, tomato by 11%, potato by 9.1% and finally other fruits and vegetables by 6.5%.

### **Current food consumption**

To assess current food consumption patterns, the study employed Food consumption score (FCS) as an indicator of household dietary adequacy mainly by focusing on macronutrients and energy. During the survey time, precaution was taken by the researcher by taking into account of festivals, fasting times, meals taken outside and other similar times which may possibly distort the data. Moreover, during the grouping of food varieties, local food varieties were taken into consideration and were incorporated.

**Chart 1. Food consumption frequencies among varieties of food groups**

Source: Survey result, 2015

Using a 7 day recall period, the information collected on the variety and frequency of various food groups' consumption; high protein and high micronutrient carrier food groups' consumption was found to be relatively very low as compared to other food groups and the diets were not sufficiently nutritious enough. Similar study made in the region revealed that households with a poor consumption, eating the equivalent of cereals and oil on daily basis and sugar three times a week, and this are considered to have a bare minimum consumption under an extreme household food insecurity<sup>11</sup>.

**Table 2. Household Food consumption score across the study areas**

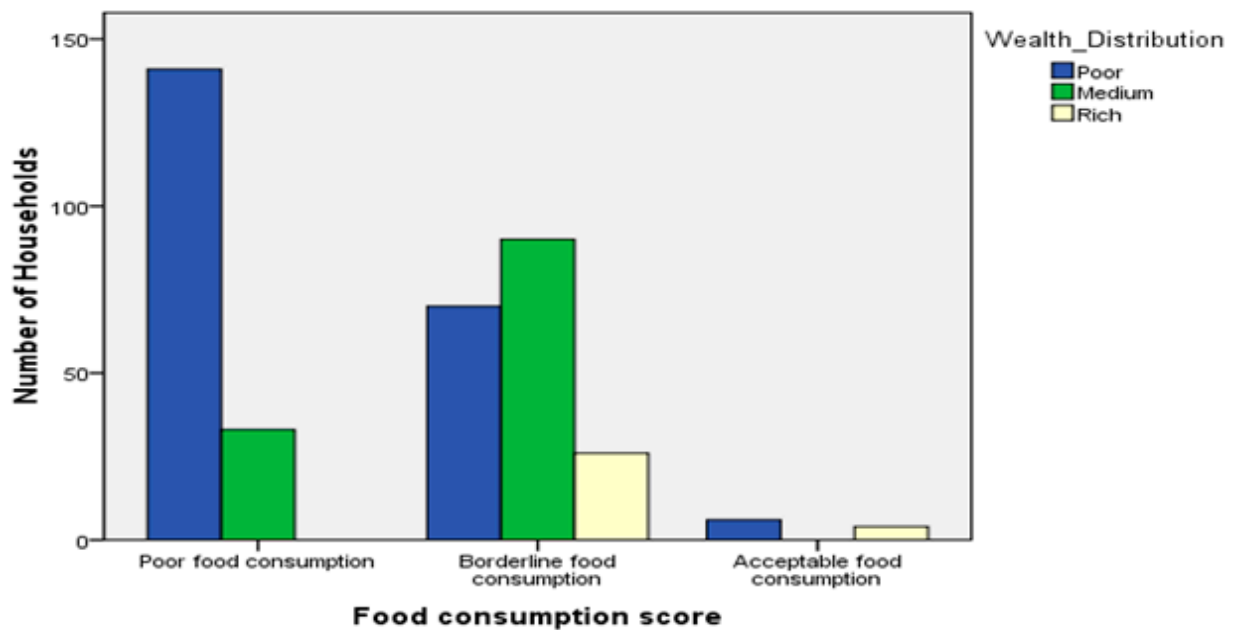
Food consumption Score	Study areas			Total	Percentage
	Ayenalem	Genfel	T.A. Sanded		
Poor food consumption	75	57	42	174	47.02
Borderline food consumption	73	64	49	186	50.27
Acceptable food consumption	3	2	5	10	2.7
<b>Total</b>	151	123	96	370	99.99

Source: Survey result, 2015



Households with acceptable food consumption accounted only 2% of the total sample population whereas households' with borderline food consumption take the largest share followed by poor food consumption accounting for 47%. A similar study made in Tigray region by employing Food Consumption Score revealed that 14.5% of the total households in Tigray region had poor food consumption with maximum in Adigrat region (35%) and Zalambesa (15%)<sup>11</sup>.

**Figure 2. Food Consumption patter across different wealth groups**



Source: Survey result, 2015

The total share of households in the wealth group of poor are the highest in number and are the ones with the poorest food consumption whereas, there are no rich wealth ranking with poor food consumption score. However, there are few number of households in the poor wealth ranking with borderline food consumption and acceptable food consumption. No female headed households was having an acceptable food consumption, where majority were found to be under poor food consumption.

Regarding Months of Adequate Household Food Provisioning (MAHFP), it was found that 75.6% of the total sample population were facing insufficiency in food supplies for less than 9 months in a given year whereas the remaining were having more than 9 months of severe insufficiency. The average MAHFP in the study areas in 6.8 months, and nearly all the households who have less than six months of adequate food supply are the majorities with a very poor food

consumption pattern. Majority of households with an average of 6 to 8 months of MAHFP have a borderline food consumption pattern.

**Table 3. Body Mass Index of adult member of households**

<b>BMI</b>	<b>Freq.</b>	<b>Percent</b>
<b>Severe thinness</b>	117	10.8
<b>Moderate thinness</b>	86	7.9
<b>Mild thinness</b>	152	13.9
<b>Normal range</b>	716	65.9
<b>Pre-Obese</b>	16	1.5
<b>Total</b>	1087	100.0

Source: Survey result, 2015

The survey result on BMI is having a positive range, nevertheless, the number of respondents who are underweight and in severe thinness was not negligible. The proportion of respondents who are underweight was found to be 32.6%.

The study has prepared an index which can merge the three food security measurement components calculated above to arrive at a conclusion in the food security status of the smallholding farmers in the study areas. As a result, for merging the three measurement indices used to measure food security status of smallholding farmers; (namely Food Consumption Score, Months of Adequate Food Provisioning and finally Body Mass Index) and to arrive at a concluding point of measurement, the study based on the basic index formation of Human Development Index (HDI). The three indices were treated and calculated after defining their minimum and maximum values as follows;

$$\text{Dimension Index} = \frac{\text{Actual value} - \text{Minimum value}}{\text{Maximum value} - \text{Minimum value}}$$

After computing the dimension index of the three indices, principal component analysis was employed to produce an estimated and approximate weights of the three coefficient parameters of the indices. Principal component analysis is used in such a way where the values of the three indices are expressed as functions of possible causes in the quest to find which are the most important ones. Computing the weights of the given indices avoids the conjecture choice of giving equal weights, which was a similar critics put on the earlier HDI computation. After the application

of the computed weights, cutoff points were set up to enable analysis in the food security trends and to provide a benchmark for success.

**Table 4. Food security status of households**

No.	HH Food Security status	Freq.	Percent
1	Food Secure	44	11.89
2	Transitory food insecure	206	55.68
3	Chronically food insecure	120	32.43
	Total	370	100.00

Source: Survey result, 2015

The study found that from the total 370 households, only 44 (11.89%) were food secure whereas the rest majority fall in the transitory food insecurity group followed by chronically food insecure. Beyond half of the sampled households were transitory food insecure, though this is regarded as a short term shock in the ability to produce enough food, yet these group are highly vulnerable to any shock too.

## Conclusion

Ethiopia has been frequently affected by food deficits and it has been more worsened by the impact of El-Niño where the number of population who are in need of direct food aid has increased tremendously mainly due to high dependence on the rain fed system of crop production. This study has tried to present results of various statistical analysis using data gathered from 370 households socio-economic condition, food consumption pattern, household food supply and access and finally food utilization to assess food security condition in the study areas. One major finding is that the despite the low level of crop productivity which is mainly attributed by local weather and environmental conditions, the livelihoods of majority smallholding farmers remains undiversified. Their primary source of livelihood mainly depends on the rain fed small-scale agriculture. Majority of the household members were found in child age group (between 0 to 14 years) and which requires a huge investment in socioeconomic supports like health and education.

Moreover, it was found that female headed households were having a reduced amount of food consumption as compared to male headed households. Likewise, there was no household with an acceptable food consumption with either an experience of running out of food or fear of running

out of food before reaching the next harvest season. Regarding food availability, it was found that there is a low average number of months of adequate food supply. In addition, there was a significant relationship between food consumption score and Months of Adequate Household Food Provisioning (MAHFP) where households' higher number of months of adequate food supply were the ones with an acceptable food consumption pattern. The BMI revealed that majority of the respondents to be in a normal range of BMI, nevertheless, the number of population who are underweight was not negligible.

Lastly, the three indices were combined in order to classify households food security condition and basing on that it was found that more than one third of the total sampled population are chronically food insecure, about half of the population were transitory food insecure and the rest small number of households were food secure. One of the most crucial step is the need for a more collaboration of government bodies with NGO's, civil society groups and the private sector to promote people's participation and making the whole process of implementation transparent and accountable to people. Especially, the involvement of women in economic activities is very negligible and introduction of self-help groups coupled with supportive trainings and capacity building programs for women so as to encourage them more to actively engage in economic activities.

In addition to this, especial emphasis should be given for cash for work programs to protect households from asset depletion, but the in exchange cash provision should be increased in way that can at least provide the minimum poverty wage. Farmland holding size in the study areas was really low and policies should be designed or revision of land reform policies are required to increase per household farmland holding sizes such as voluntary resettlement programs. In concomitant to this, modern agricultural inputs such as irrigation, improved seeds and fertilizers should be more provided in a subsidized manner coupled with trainings on their adoption especially with regard to irrigation should be more emphasized.

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