

Full Length Research Paper

## Status of Household Food Security in Selected Pepper Livelihoods of Shashogo Woreda, Hadiya Zone, Ethiopia

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### Abstract

Most Pepper livelihood of Ethiopia was known to be challenged by food security challenges. The purpose of this study was to investigate the status of pepper production and household food security in Shashogo Woreda, Hadiya Zone, SNNPR, and Ethiopia. The study employed cross sectional survey design which incorporates both quantitative and qualitative survey method. The data were collected from primary and secondary sources. Primary data were gathered by using structured household survey questioners, key informant interview and focus group discussions. For this study, data from 322 sample households were collected from three rural kebeles namely: Kemacho Borara, Shaymbe Wanchikota and Alage. The data were analyzed by using SPSS software version 20. Population number increase from time to time whereas land holding size and soil infertility are declining. Therefore, to alleviate this problem providing training regarding to family planning is essential. To reduce the problem of more sever land scarcity in the Shashogo Woreda to where there is available land within the region. Hence, Shashogo woreda's government bodies should take this action into consideration. Enhancing the indigenous knowledge on preservation and storage of food, post-harvest period saving, and diversifying income sources. To maximize agricultural production government should facilitate access of agricultural inputs in credit basis. In addition to that, to alleviate input cost problem, using compost instead of chemical fertilizers support poor households. Government should give high emphasis to increase food production and productivity of the farmers through improving better access and availability to improved agricultural technologies: promoting strategies such as crop diversification, providing of subsidized farm inputs to enhance households' food production and productivity. Livestock holding is one of the factors affecting the food security status of households in the study area. Therefore, based on the results of this study to improve production and productivity of the livestock, this will eventually increase food security situation of the rural households.

**Keywords:** Econometric Analysis, Household, Food Security, Pepper

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### Introduction

Pepper is a common ingredient of the daily dish of almost all Ethiopians. People consume pepper for intake enhancement as well as to supplement the dietary household needs. The similar study are found in Ethiopia describes that many vegetables including pepper are important in neutralizing free radical (oxidant) known to cause cancer, cataracts, heart disease, hypertension, strokes and diabetes (Bezabih *et al.*, 2007). Additionally, it serves as raw material for local processing industry. The product processed by the industry is spice of hot pepper/ chilli, tomato, paste, tomato juice and oleoresin which is substantially contributes to national economy while

exported to foreign market (ATA, 2014). It is the main part in the daily diet of most Ethiopian societies. The average daily consumption of hot pepper by Ethiopian adult is estimated at 15 g, which is higher than tomatoes and most other vegetables (MARC, 2004). Hot pepper is a popular vegetable and plays an important role in the national economy of the country. It serves as raw material for the processing industries, important cash crop to farmers, and a source of employment to urban and rural populations. It is evidenced that enhanced consumption of vegetables (i.e. pepper) and fruits play significant contribution reducing micronutrient deficiency which is related to health problem caused by a lack of essential vitamins and minerals such as vitamin A, zinc, iron, and iodine in the diet (Lumpkin *et al.*, 2005). In southern region of Ethiopia the total area covered with pepper and total production in years 2005-2008 were 37,562 ha and 27,352 tons, respectively and the productivity of pepper in SNNPR was 0.73 t/ha, where as the average dried yield obtained in research condition 1.8-2.5 t/ha (OARD, 2007). The world average yield of pepper is 3.75 t/ha (CSA, 2005). The share of the region in the total production of red pepper in the country constitutes 25%, next to SNNPRS, which produces about 64% of the total production in the country CSA (2001/2002). In 2008/2009 production year the total cultivated land and production in the region was 41,069 hectare and 530,466 quintal respectively (CSA, 2009). Rain fed pepper production in 2005/06 production was 777,602 quintals In SNNPRS. This accounted 43% of the country's production (CSA, 2006). In addition to having major role in Ethiopians daily dish it also plays an important role in the national economy. It is an important cash crop today; on average 79% of pepper production is for market in SNNPRS (CSA, 2003).

Hot pepper serves as one of the important sources of food and income to smallholder farmers and as exchange earning commodity (Beyene and David, 2007). The backbone of its economy has been predominantly the agriculture sector when judging from the point of view of the people's occupation, its contribution to GDP, export of commodities and orientation of the industries. In the southern parts of the country especially in Hadiya Zone (Shashogo *Woreda*), the crop is widely cultivated by farmers. The current development policy and strategy has also targeted the crop for poverty reduction and food security goals for resource poor farmers at household levels.

Pepper has the ability to play a role in rural income generation, poverty alleviation, and food and nutrition security among producers (Adewoyin *et al.*, 2011). Shashogo is one of the Hadiya *Woreda* where pepper is highly grown and it uses for income generation and which is a popular mainly eaten for foods.

Its importance is not only limited on consumption point of view but also very prominent to farmers by generating income, creating employment opportunity and ensuring food security. In many household, pepper provides the only needed flavor to enhance intake of otherwise blend diets. It is also one of the major income generating crops for most households of the pepper producing areas and it plays a vital role in food security in Ethiopia (Roukens, 2005).

The concept of household food security is a more recent development and the bulk of literature dated from 1980s equating national food security with food self-sufficiency is a problem that needs to be clearly understood. Many countries those used to be considered as self-sufficient in food were found to be food insecure due to the fact that they either lack an efficient food system or the capacity to the level of food entitlement. This indicates that attaining macro-level food self-sufficiency does not ensure the achievement of household food security (Getahun, 2003). Studies on assessment of food security can take different level of unit of analysis, at national, regional, community, household and individual levels. Since collecting precise information for each individual might be impossible or too costly, especially in poor country like Ethiopia, there is an option which is widely practiced in food security research. This is a study starts at household level analysis by applying a weight (Adult equivalent scale or ratio ) to adjust to its composition and drives weighted per capita estimate (Jacobs, 2009).

Hence, it is worthwhile to look at the concept of household food security since this study's center of attention is at household level. Therefore, food security strategy has to address household-level food production and investment in food production and storage. However, are essential but not sufficient vehicles for solving household-level malnutrition and household food insecurity problems (Rukuni, 2002). Debebe (1995), as cited in Ayalew (2003), indicates that household food security mainly conditioned by factors, which are related to the process of acquisition, household procurement strategies and socio economic condition of the society. With regard to this, the key elements that are critical to household food security are availability and access. The former is further influenced by the different source of food and handling patterns which facilitate the time dimension of food availability in the household. Besides, household is identified as food secured if entitlements of demand for food security is greater than food needs, which is defined as the aggregation of individual requirements. At individual level, the definition is much more straightforward. An individual is food secure if his or her food consumption is determined by claim the individual has on household food source.

The purpose of this study was to determine the economic status of pepper producing households' food security in Shashogo *Woreda*, Hadiya Zone, SNNPR, and Ethiopia.

## Materials and methods

### Methodology

The research design employed in this study was cross sectional survey design which incorporates both quantitative and qualitative survey method. The data were collected from primary and secondary sources. Primary data were gathered by using structured

household survey questioners, key informant interview and focus group discussions. For this study, data from 322 sample households were collected from three rural *kebeles* namely: Kemacho Borara, Shaymbe Wanchikota and Alage. The data were analyzed by using SPSS software version 20 employing descriptive statistics, logistic regression model and food security measuring models household food balance model, household food insecurity access scale, and household dietary diversity model were used to analyze food security status of households.

## Results

### *Household Food Security Situation*

The definition of food security adopted at the World Food Summit in 1996, four particular dimensions can be identified: availability, access, utilization and stability. Food security is realized, if all these four dimensions are fulfilled at the same time. However, emphasis has been given to some these dimensions. The status household food security is discussed in the subsequent sections.

### *Food Security Status of Rural Households*

Household dietary energy supply measured in kilocalorie (kcal) was used to determine food security situation. During survey period the necessary data were gathered from sample households concerned on each type of annual grain and livestock products, it was converted from kilogram to kilocalorie by using Household Food Balance Model (HFBM) to quantify the net available grain and livestock products. Household food balance model is a simple numeric tool used to quantify net food available at household level for a specified period of time, usually one year. It measures daily per capita calorie consumption among household members.

Then, calculated kilocalories were compared based on the national average daily calorie requirement, which is 2100 kcal Ethiopian Health and Nutrition Institute (EHNI, 1997) developed for Ethiopia. According to Stephen Devereux (2006), households food security status classification with caloric consumption per person per day like households can consume consistently above 2100 kcal which indicates food secure, between 1800-2100 kcal consumption indicates marginally food insecure, between 1500-1800 kcal moderately food insecure and less than 1500 kcal consumed by households severely food insecure. Hence, household member who obtain on average more than 2100 kilocalorie were classified as to be food secured whereas compared to those who obtained less than 2100 kilocalories who were classified as to be food insecure.

The results of household food balance model calculation shows that on (Table 4.17 below), from the total sampled 322 households 10.8% (35) households were able to assure adequate daily per capita dietary energy supply and 89.2% (287) of the surveyed households were found to be food insecure compared with the national recommended minimum daily requirement which is less than 2100 kcal per day per person. The HFBM results indicate that majority of sample households in the study site were exposed to the problem of food shortage. According to survey results majority of the study area respondents were not able to meet the minimum dietary energy requirement were not able to reach dietary daily per capita threshold meaning (2100 kcal), respectively. Accordingly from the each *kebele* respondents were able to meet the minimum recommended dietary requirement Percentage distribution.

### *Availability of Daily Dietary Energy of Sample Households*

The household food balance model computation result revealed that from total sample households 69.9% (225) had intake of less than 1500 kcal, 10.9% (35) of the households had intakes ranging from 1500-1800 kcal per day, 8.4% (27) households fall in the range of 1800-2100 and the remaining 10.8% (35) of them have a daily per capita kilocalorie available within the greater nationally recommended value of 2100 kcal.

**Table 1:** Distribution of daily per capita kilocalorie of sample households

Categories by Kcal	Frequency	Percent
<1500	225	69.9
1500-1800	35	10.9
1800-2100	27	8.4
>2100	35	10.8
Total	322	100.0

(Kcal = kilocalories; Source: Field survey data, 2017)

In general, from total sample households of the study area only 10.8% (35) households ensured minimum recommended allowance of daily per capita kcal, this indicates that from the total households of the sample, small proportion were food secured and they could get sufficient amount of food but the majority of the sample households 89.2% (287) of the surveyed households were found to be food insecure compared with the nationally recommended minimum daily requirement which is less than 2100 kcal/day/ person.

### *Food Sufficient Months of Sample Households*

According to the survey result shown below on Table 4.18, in the last twelve months sample households were vulnerable to food shortage. From total respondents 28 (8.7%), 16 (5%) , 18(5.6%), and 207 (64.2%) obtained enough amount of food from all year

round, from 9-12 months, from 6-9 months, and 3-6 months respectively. The remaining less than 3 months 53(16.5%) sample households were getting adequate amount of food for more than 3 months in the year. Households with large household size have also to bear with large period of food gap and have positive and significant relationship with food security. When we observe in the above table, food deficiency period increased with an increasing of household size. By looking the figure in another angle, household size have positively related to food insecurity, which means the larger households have vulnerable to food insecurity than the smaller household size. As it is indicated on Table 4.18, education was found to have a significant and positive relationship with household food security. From total respondents 28 (8.7%), 16 (5%), 18(5.6%), and 207 (64.2%) obtained enough amount of food from all year round, from 9-12 months, from 6-9 months, and 3-6 months having less than six months food sufficient but more than six months they were exposed to food deficit.

**Table 2:** Sample households by food sufficient months

Household sufficient food	Frequency	Percent
All year round	28	8.7
From 9-12 months	16	5.0
From 6-9 months	18	5.6
From 3-6 months	207	64.2
Less than 3 months	53	16.5
Total	322	100.0

#### **Food Insufficient Months of Sample Households**

The study area key informants explain that majority of households were obtained adequate amount of food particularly during harvest and post-harvest season, which is from November to February. This indicate that, the opportunity of household's food availability and accessibility start from November and reach climax in the months of December and January then in February start to decline at decreasing rate. From each sample *kebele* areas food insufficiency problem as follows: The crop and livestock production could not cover yearly food need of our family. In our *kebele* case, different factors attributed for food insufficiency.

The survey result shown on Table 4.19 below, from total respondents 322 were faced to severe food insufficiency for more than three months. From September to December 2 (0.6%), from January to April 22(6.8%), and from May to August 298(92.6%) these due to different factor of food security majority of sample households headed were vulnerable to food insecurity.

**Table 4.** Distribution of households by food insufficient months

Food insufficient year	Frequency	Percent
From September- December	2	0.6
From January- April	22	6.8
From May-August	298	92.6
Total	322	100.0

From the experience, our household members most of the time exposed to food deficit from May to August. Maize products covered more than three months food gap. This product is very familiar food in our society and covers half of our land. Even at severe hunger season from other areas especially from the drier area as our relatives send their children to live through the food crisis and for the remaining relatives we provided maize product specially *Qita* as a gift. The other most significant problem that reduces the production in our area is sale of maize in order to purchase coffee, salt, oil and soap but this cause's maize disease, due to this factor the maize production and productivity reduced. Even now, those who do not have maize products are exposed to food insecurity where as those who have maize product owners are better food secure.

#### **Main Food Sources of Sample Households**

Most of the time access of food is depends on whether households has enough income to purchase food at existing price or has sufficient land and other resources to grow its own food.

**Table 5:** The main food source of sample households

Main food source	Frequency	Percent
Own Production	214	66.5
Purchased from the Market	39	12.1
Aids From the Government	69	21.4
Total	322	100.0

As it is indicated on Table 4.20, from total sample households majority 214 (66.5%) of them were get their food through own farm production and 39 (12.1%) respondents also obtained food through purchasing from market. From key informant point of view, in order to purchase the right amount of food, income level affects households' access of food, even those who obtain income from

different angles were not cover their yearly food requirement and spent great proportion of their income to purchase food items and they were exposed to price shock. The remaining amount of 69 (21.4%) respondents obtains their food through transfer of gift or aid, respectively.

#### **Food Shortage of Sample Households**

However, most of the farmers are experienced food shortage every year; there is a difference in duration for which households have out in the open to the problem. The main economic base of the study area lies on a survival rain-fed agriculture, with high rainfall unpredictability in occurrence, spatial and temporal distribution of rainfall. Dependence on unreliable and low productivity, rain-fed agriculture will be the primary determinants of household's food insecurity in Ethiopia (Devereux, 2000). Even under normal rainfall distribution, agricultural production often fails to sustain life of the community for a prolonged period throughout the year. Farm management system in the *Woreda* follows traditional method and the irrigation practices are very limited due to scarcity of surface and ground water in the area, and agriculture is dependent on rain-fed farming for this matter. The survey result shown on (see on table 4.21 below), from total sample households 322 food shortage.

**Table 6:** Food shortage of sample households

Food shortage	Frequency	Percent
Yes	212	65.8
No	110	34.2
<b>Total</b>	<b>322</b>	<b>100.0</b>

The information forward, from key informant interview, indicated that household's waste grain, remittance and other income capital during good or grain harvesting seasons' (December to February) then, majority households faced in food shortage for nine months especially, march to November. The study results show that, households face food shortage in the year under study. Amongst to majority of households respondents "Yes" food shortage 212 (65.8%) and 110(34.2%) the respondents facade food shortage for about "No" relatively long period of time.

#### **Stable Foods of Sample Households**

According to results found out that the major crops produced in the study area were the data from the office of agriculture revealed that cereals constitute the vast proportion of crops grown in the area. Maize, sorghum, wheat, barley, *teff*. Maize cereal crop is the most food in the study area; all most all households use maize as main stable food, the reason to grow most households maize crop as a major staple food. Sorghum is a very important cereal in the study area and is essential for improving food security since it is highly consumed. Wheat is the single most important productive cereal in the study area as compared to other cereals. Because wheat is used as a cash and food sources to the households, for example farmers sell wheat grain to pay credit, to buy farm inputs such as chemical fertilizer and to cover other households' expenses. According to (see Table 4.22), from total sample households 322 produced at small scale not because they are needless but due to the scarcity of farmlands on which they are to be cultivated and because the peasants give priority to stable food crops. Also as observed from survey result, generally sampled households produced of different crop products.

**Table 7:** The major stable foods of sample households

Food type	Frequency	Percent
<b>Maize</b>	Yes	322
	No	-
<b>Sorghum</b>	Yes	321
	No	1
<b>Wheat</b>	Yes	126
	No	196
<b>Barely</b>	Yes	42
	No	280
<b>Teff</b>	Yes	85
	No	237
<b>Oil seeds (linseeds, noug and sesame, etc)</b>	Yes	3
	No	319
<b>Vegetables (onions, tomato and, cabbage, etc )</b>	Yes	133
	No	189
<b>Fruits (orange, banana and, papaya</b>	Yes	105
	No	217

**Household Food Insecurity Access Scale /HFIAS/****Household Food Insecurity Access Scale to Sample Households**

Food security is widely defined as the ability of all people to access enough food for active and healthy life. Food insecurity on the other hand is the inability of households or individual to meet required consumption levels in the face of fluctuating productions, prices and incomes. According to Sen (1981), in his concept of entitlements, he explained that the production and income level determines the ability of household or individual's access to food. Entitlements encompass two dimensions: endowment and exchange. Endowment includes all forms of capital (natural, physical, human, financial and social) and that has an exchange value. On the other hand, household's socio-economic characteristics indicate level of resources endowment and capital and capacity of exchange to food in the community. Inequality in assets ownership (particularly size and type of land ownership, livestock holding), human capital (e.g. number of adult educational level) as well as other form of capital can affect the food production and access to off-farm income, which can enhance the ability of households to acquire food.

According to the survey result shown below on Table 4.23, from that among 322 households involved in the surveyed 21.7% (70) was food secured including both food secure and moderate while the remaining 78.1% (252) households were classified as food insecure and comprised both mildly food insecure and severely food insecure. The classification was done based on the answer to a set of 9 questions by households that are combined to produce the Household Food Insecurity Access scale as proposed by FANTA (2007). Those questions are designed to indicate three levels of food insecurity namely Anxiety and uncertainty about household food supplies, insufficient quality (including food variety and preferences) and insufficient food intake and physical consequences. However, as this study is concerned about chronic hunger, food insecure households were determined based on answers to the question in the category of insufficient food intake and physical consequences. Therefore, a household was classified as food insecure if it answers yes to at least one question under the category that indicates insufficient food intake and physical consequences.

**Table 8:** Distribution of HFIAS to sample households

Four level of HFIAS	Frequency	Percent
Food secure	35	10.8
Mildly food insecure	27	8.4
Moderately food insecure	35	10.9
Severely food insecure	225	69.9
Total	322	100

**Household Food Insecurity Access Prevalence**

According to Coates *et al.*, (2007), the HFIAS prevalence indicator categorizes households into four levels of household food insecurity (access): 1) food secure, 2) mild, 3) moderately 4) severely food insecure. Households are categorized as increasingly food insecure as they respond affirmatively to more severe conditions and/or experience those conditions more frequently.

A food secure household experiences none of the food insecurity (access) conditions, or just experiences worry, but rarely. A mildly food insecure (access) household worries about not having enough food sometimes or often, and/or is unable to eat preferred foods, and/or eats a more monotonous diet than desired and/or some foods considered undesirable, but only rarely. However, it does not cut back on quantity nor experiences any of three most severe conditions (running out of food, going to bed hungry, or going a whole day and night without eating). A moderately food insecure household sacrifices quality more frequently, by eating a monotonous diet or undesirable foods sometimes or often, and/or has started to cut back on quantity by reducing the size of meals or number of meals, rarely or sometimes. But it does not experience any of the three most severe conditions. A severely food insecure household has graduated to cutting back on meal size or number of meals often, and/or experiences any of the three most severe conditions (running out of food, going to bed hungry, or going a whole day and night without eating), even as infrequently as rarely. In other words, any household that experiences one of these three conditions even once in the last four weeks (30 days) is considered severely food insecure (Coates *et al.*, 2007).

Based on household food insecurity access score principle total thirty respondents or those who asked occurrence and frequency of occurrence questions were categorized into four levels. Out of thirty respondents four, seven, fourteen and five were categorized as food secure, mildly food in secured, moderately food in secured and severely food in secured, respectively.

**Household Dietary Diversity of Food Security**

Dietary diversity is defined as the number of different foods or food groups consumed over a given reference period (Sthapit, 2004). Data on household dietary diversity was collected using 24 hours recall dietary intake. Respondents were visited at their homes during the survey. For this study, the twelve food groups that included cereals; white root and tubers; vegetables; fruit; meat; eggs; fish; legumes, nuts and seeds; milk; oil and fats; sweets; spices, beverages and miscellaneous, recommended by Food and Agriculture Organization of the UN (FAO, 2007) were used to assess household dietary diversity scores (HDDS). The study found that dietary diversity was significantly influenced by household income, savings, and to higher dietary diversity indexes, probably due to

households expanding their food expenditure to include more diverse. Dietary diversity is a qualitative measure of food consumption that reflects household access to a variety of foods and is also a proxy of nutrient adequacy of the diet of individuals (FAO, 2011).

Dietary diversity shows the different types of foods consumed and reflects the consumption of a wide variety of food across nutritionally diverse food groups (Kennedy *et al.*, 2010). It is measured as the number of foods or nutritionally significant food groups that a household consumes (Ruel, 2002; Smith & Subandoro, 2007). Hoddinott & Yohannes (2002), maintain that dietary diversity is an attractive indicator of food security for several reasons. In Shashogo as elsewhere in many parts of Ethiopia, dietary diversity is affected by cultural and religious practices such as fasting and dependency on limited staple foods. The survey results below show that almost the same dietary diversity (Table 4.24). Furthermore, a small standard deviation indicating small deviation of the values from the mean which implies that the households were having almost similar food consumption pattern. During this a long period fasting 40 days for Orthodox Christians who were preparing for 'Fasiga' people do not consume animal source foods, including milk (goat, cow, etc.), cheese, butter, eggs, meat, and fish. On one hand, fasting encourages people to feed on other variety of food such as vegetables, pulses and fruits for rich families with the ability to reach the market to buy them.

**Table 9:** Dietary diversity of sample households

HDSS	Sample households	Mean	Std. Deviation
	322	12.71	3.590

### Conclusion

The study revealed that less proportion of the sampled households could ensure their daily recommended kilocalories, but high proportions of the sampled households were not able to meet their daily recommended kilocalories as household food balance model analysis indicated that only 10.8% sampled households could ensure their daily recommended kilocalories, but 89.2% respondents could not. Among this, 8.4% sample households were marginally food insecure, 10.9% moderately food insecure and 69.9% severely food insecure as household food balance model analysis revealed. Households with various income sources have a chance to improve household food consumption and are less vulnerable to food insecurity. As the area is prone to drought in different seasons creating alternative sources of income and diversifying it will enhance farmers' food security status. For many years farmers were exposed to a flood which displaces them from their land during the water logging at summer season. Pepper is also one of the incomes earned by farmers to overcome their food shortage problem in the area.

### Recommendations

Based on the finding of the study recommendation of the following issues are forwarded as recommendation to enhance rural households' food security situation in the study area. As study results showed one of the major problems of the households to ensure food security. Therefore, based on the researcher finding the following recommendations were forwarded:

Population number increase from time to time whereas land holding size and soil infertility are declining. Therefore, to alleviate this problem providing training regarding to family planning is essential. To reduce the problem of more sever land scarcity in the Shashogo *Woreda* to where there is available land within the region. Hence, Shashogo *woreda's* government bodies should take this action into consideration. Enhancing the indigenous knowledge on preservation and storage of food, post-harvest period saving, and diversifying income sources. To maximize agricultural production government should facilitate access of agricultural inputs in credit basis.

In addition to that, to alleviate input cost problem, using compost instead of chemical fertilizers support poor households. Government should give high emphasis to increase food production and productivity of the farmers through improving better access and availability to improved agricultural technologies: promoting strategies such as crop diversification, providing of subsidized farm inputs to enhance households' food production and productivity. Livestock holding is one of the factors affecting the food security status of households in the study area. Therefore, based on the results of this study to improve production and productivity of the livestock, this will eventually increase food security situation of the rural households.

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