

**Full Length Research Paper**

## Factors Affecting Pepper (*Capsicum spp.*)-Food Security Nexus in Households of Shashogo Woreda, Hadiya Zone, Ethiopia

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**Abstract**

Pepper marketing and storage posed a challenge on food security at household level in Ethiopia. This study was, thus, initiated to investigate the various factors influencing 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 increases 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 severe 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:** Marketing, Storage, Household, Food Security, Pepper

**Introduction**

There are many challenges that farmers face in the pepper production. Due to this fact, pepper production challenges (shortage of seed, pesticide, fertilizer, labor, capital, lack of skill, shortage of ox, diseases problem, insects' problem, theft problem and adulteration (Workneh *et al.*, 2014). Pests and disease attack are one of the major problem pepper farmer facing, has subsequently aggravate a reduction in the yield and income accruable to farmers (Chris, 2015). Most of the world's pepper is produced by small landholder farmers, who sell their crops to middlemen or traders, who sell it to processors (Hay, 2009). Pepper is an important agricultural crop not only because of its economic importance but also due to the nutritional, medicinal value of its fruits as well as being excellent source of natural colors and antioxidant compounds (Howard *et al.*, 2000).

It enhances agricultural production and improves, income of rural population, opening employment opportunities for the poor, supports national economy by producing industrial crops that are used as raw materials for value adding industries, exportable crops and sustainable strategy for increasing household food security. The climatic and soil conditions of Ethiopia allow cultivation of a wide range for growing pepper. Pepper covers 67.98% of all the area under vegetables in Ethiopia (CSA, 2011/2012). According to

EEPA (2003), red pepper is a major spice and vegetable crop produced by the majority of producers in SNNPR, Oromia, and Amhara regions. Despite the significance of pepper in Ethiopian economy and current income generating capacity of pepper as compared to its magnificent potential in the country. The most commonly grown type is the Mareko Fana variety, a pungent long chilli of dark-red appearance (pungency is at least twice as high as required for western food processors). In Ethiopia, the total area under hot pepper for dry pod (Berbere) and for green pepper (Karia) in 2008 was estimated to be 8,580.69 ha, and 11, 0405.89 ha respectively (CSA, 2009). Although, globally, sufficient food is produced to make it possible to attain food security (Islam, 1995), the number of hungry in the world has increased from about 840 million (FAO, 1996) to about 925 million in 2010 (FAO, 2010), with 98% living in developing countries (FAO, 2010). The United Nations Children's Fund indicates that at least 150 million children are undernourished, 32 million of whom live in Africa (UNICEF, 2001). This demonstrates that producing sufficient food globally does not necessarily mean equitable and proportionate distribution among people. Similarly, sufficient food production nationally may also not translate to food security at the household level, as is the case in South Africa (Van der Berg, 2006). Currently, in the third world where hunger and famine are uncontrolled, food security is a topic of considerable attention. Nearly thirty definitions of it have been well-known by Maxwell and Frankenberg (1992).

But food security definition has considerably been changed over the time and recently cited to have reached more than 250 (Degefa, 2006). In this respect, the definition formulated in the first world food meeting is "All people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and health life" (FAO,1996). This definition constitutes core elements such as

- (i) Sufficiency of food which represents the calorie needed for an active and health life;
- (ii) Access which refers to the ability to produce, purchase, exchange or receive food as a gift
- (iii) Security that refers the balance between susceptibility, risk and assurance and,
- (iv) The time dimension that deals with whether food insecurity can be chronic, transitory or seasonal.

In China, pepper yield reached 15 metric tons per hectare in 2001/02; this shows that there is high productivity difference in China and Ethiopia whose production is about 1.4 metric tons per hectare (CSA, 2003). According to CSA, (2015/06) of Ethiopia pepper product harvested on 142,795.16 hectare of land was 2,627,908.26 quintal. According to SNNPR, (2016/2017) the total pepper production covers 143,373 hectare of land was 286,799.35 quintal of land production and also Hadiya zone of the statistical information from the total covers land of pepper 3,775 hectare of land was 46,545.75 quintal of land productivity, respectively the researcher obtained from Shashogo *woreda* covers of pepper land 3,685 hectare was harvested 31,322.5 quintal of pepper production. In addition to this, in Ethiopia pepper product 2001/02 was only 77,962.4 metric tons harvested on 55,381 hectares (CSA). Smallholder farmers operating on by most estimates, an average of one hectare, account for about 95% of agricultural output (Pender *et al.*, 2004). The purpose of this study was to investigate the various factors that affect pepper production and household 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

### Factors Affecting of Pepper production

The contribution of pepper production to household food security and income generation has been affected by surveyed different factors affecting of pepper production including drought, lack of market information, inadequate transportation facilities, inadequate government support, inadequate storage facilities, shortage of improved seed, disease and Pest attack, access to credit and price fluctuation. According to (see on Table 1 below), indicates households respond by saying yes or no on these factors of pepper production. Among this, factors particularly shortage of rainfall amount, drought, diseases and pest attack are dominant and respectively factors affecting of rural households' food production and food availability as respondents gave information in the study area. Because, this factor directly affect pepper production and decreases households' food availability situation.

From Kemacho Borara *kebele* key informants indication, the most factors to produce adequate amount of crop production is drought, insufficient rainfall amount, inadequate landholding size, shortage of improved seeds, poor income access to purchase adequate amount of inputs and access to credit. Agriculture dominates the Ethiopian life to the extent that little progress can be made unless agriculture is attacked directly, by and large, agriculture in Ethiopia is subsistence. This is particularly true to the major food crops grown in the country. The major food crops are produced in almost all regions of the country in spite of the variation in volume of

production across the regions. The variation may be attributed to the extent of area devoted to each crop type, weather change and a shift in preference for the crops grown (CSA, 2014).

**Table 1.** The factors affecting of pepper production

Factors affecting	Response	Frequency	Percent
Rainfall shortage/Drought	Yes	302	93.8
	No	20	6.2
Lack of market information	Yes	209	64.9
	No	113	35.1
Inadequate transportation facilities	Yes	162	50.3
	No	160	49.7
Inadequate government support	Yes	173	53.7
	No	149	46.3
Inadequate storage facilities	Yes	175	54.3
	No	147	45.7
Disease and pest	Yes	322	100
	No	-	-
Access to credit	Yes	199	61.8
	No	123	38.2
Price fluctuation	Yes	270	83.9
	No	52	16.1

According to Shaymbe Wanchikota *kebele* key informant interview participants indicated, the most food insecurity factors are recurrent drought and shortage of rainfall amount, because in 2016/2017 production year rain fall amount was very little than the other times even different crop types were burned out immature as a result of insufficient rainfall amount, because of Shashogo *Woreda* peasants almost all depend on natural rainfall amount to produce particularly sufficient amount of crop products and Shashogo *Woreda* located in topographically lowland area, which is not that insufficient irrigation purposes.

### **Drought**

Erratic rainfall are the most Environmental factors that affect food security in the study area and Rain starts late after the normal planting season has already gone and stops early when the cultivated crops are at their vegetative stages of growth. Unpredictable weather conditions are important natural factors that make households vulnerable to food shortage. However, these resources are getting depleted over time at an alarming rate and affects farmers' agricultural production and productivity. In general, the ecology in the area has become more fragile than ever resulting in a decline in agricultural production and productivity, frequent food shortage during June, July August and unpredictable weather condition.

### **Lack of market information**

A market is traditionally defined as a specific geographical area where buyers and sellers meet for exchange of goods and services. The most common way we obtain goods and services we do not produce ourselves is to buy them from others who specialize in producing them. Marketing information can help predict, strategize, plan and act expediently, rationally and efficiently, thus reducing business risk, transaction costs and enabling market participants to explore business opportunities (Odendo and De Groote, 2007). Farmers marketing decisions are based on market price information, and poorly integrated markets may convey inaccurate price information, leading to inefficient product movement. Market is the most important factor that determines whether to continue or quit the business. Therefore, establishing effective information system can do much in improving time and situation specific information.

The informants were interviewed about their access to the Marketing and Storage of Pepper Production at Household levels. A market is any one of a variety of different systems, institutions, procedures, social relations and infrastructures where by persons trade, and goods and services are exchanged. Most of them sell their product on the local market by bringing the entire product at once. Regarding the availability of packaging material for the produced commodities of sample households different reactions were observed. The packaging material used should be acceptable to the farmer, middle-man and consumer, as well as extending the shelf life of the produce and should be easy to handle (Bleasdale and Salter, 1991). However, personal interaction with the traders and my own observation revealed that pepper packed in sacks and loaded in vehicles encountered bruises and deformities when loaded due to stacking, this reduces the shelf life. According to the household survey result indicated on Table 4.14, 280 (87%) of surveyed areas respondents were in sack, 1(3%) were basket and wooden tray box 41(12.7%).

**Inadequate transportation facilities:** Transportation is often the most important factor in the marketing of fresh produce. Ideally, transport would take produce from the grower directly to the consumer, as in many developing countries. Harvested farm produce are

transported with great difficulties from the farms to market or points of processing. The farm products are mostly transported to the market for sale. In complex marketing systems (serving towns, cities or distant countries) the cost of transport contributes significantly to the price paid by the consumer, and sometimes exceeds the value of the raw produce.

**Table 2:** Packing and transportations of sample households

Pack the produce transporting	Frequency	Percent
In sack	280	87.0
Basket	1	.3
Wooden trays/ box	41	12.7
Total	322	100.0

Informants were interviewed on the means of transport and status of Transporting used to move the commodities produced by the Households of the woreda. Means of transport of produce to the market is by walking due to the short distance from the farm gate to the market. Maalekuu and Appiah (2010), indicated that transporting is often the most important factor in the marketing of fresh produce and that losses directly attributed to the transport conditions can be high, hence produce should be kept in the best possible conditions during transport. As results revealed that the most dominant transporting of the study area was animal power (see Table 4.13 below) which includes 96.3% (310) of the total respondents, while the human power accounted for 3.1% (10), whereas the remaining transporting including motor vehicle and car transporting accounted for .3% (1) and .3% (1).

**Table 3:** Distribution of transporting using to households

Use for transporting	Frequency	Percent
Car	1	0.3
Motor vehicle	1	0.3
Animal power	310	96.3
Human power	10	3.1
Total	322	100.0

According to Maalekuu and Appiah (2010), losses directly attributed to transport can be high, particularly in developing countries. Damage occurs as a result of careless handling of packed produce during loading and unloading; vibration (shaking) of the vehicle, especially on bad roads; and poor stowage, with packages often squeezed in to the vehicle in order to maximize revenue for the transporters. In transport it can result from using closed vehicles with no ventilation; stacking patterns that block the movement of air; and using vehicles that provide no protection from the sun. Breakdowns of vehicles can be a significant cause of losses in some countries, as perishable produce can be left exposed to the sun for a day or more while repairs are carried out. Produce should be kept in the best possible conditions during transport and that the haulage of produce is quick and efficient, hence produce should be properly packaged and loaded on a suitable vehicle.

#### ***Inadequate Government Support***

The governmental body concerned with agricultural production is managing all problems related to agricultural production, including red peppers. According to *woreda* officials, major problems are outdated management techniques, appliance of old varieties, build-up of plant diseases, and insufficient motivation from the side of the farmer. Officials concerned with marketing of agricultural products are providing market information, organizing and giving trainings and raising awareness on the functioning and purpose of farmer cooperatives. According to them, the major problem is the small amount of farmer cooperatives that work with red pepper. Inadequate government support in terms of expansion of farm land and provision of farm inputs is hindering their maximum productivity.

#### ***Inadequate Storage Facilities***

Inadequate storage facilities as one of the affecting pepper production being bulky and perishable, farmers and producers face storage loss and quality deterioration. To solve these problems constructing storage and processing facilities by households and the government would be very important. Storage facilities are very important for marketing to make them available at required season. Households in the study area store pepper by preparing *Kot*. Storage services help for smooth and continuous flow of products marketed and create time utilities. Information regarding the means of storage of pepper to sample households had been assessed. According to the study finding these factors are due to low yield, improper storage by farmers, and plant diseases. Selecting storage system is a major farming activity in order to avoid post-harvest losses. The data shows that the storage system in the study area. The total sample households 121(37.6%) of placed their pepper in store or '*gotera*'. The rest stored their pepper on the floor and in a large basket '*kefo*'. About 138(42.9%) of the total sample households indicate that they put their pepper by filling in sack and placing it at '*kot*' (shelf). The distribution of sample household size given below in Table 4 shows that the inside of house 63(19.5%).

**Table 4.** Storage of pepper to sample households

Storage of pepper	Frequency	Percent
Filling in sack and placing in 'Kot'	138	42.9
In store/'gotera'	121	37.6
Inside of house	63	19.5
Total	322	100.0

### *Disease and Pest attack*

Many problems start at the seed-bed, when farmers use water ineffectively, sow disease infected seeds, or do not use preventive chemicals. This was directly related to agricultural input access problem. Unavailability of pesticide and herbicides mainly create these problems in addition to the problem of accessing to improve and diseases resistance seeds. This shows most farmers are using poor quality seeds, as high quality seeds are often not available at planting time and are expensive. The other reason for this problem is the problem of management skill. Inadequate farmer skills and knowledge on production and farm management creates such problems. This is mainly related with poor extension service in the areas.

### *Access to credit*

Credit facilities are important institutional services to finance poor households for input purchase and ultimately for utilization of new technologies. However, from household survey 199 (61.8%) households have yes access to credit while 123 (38.2%) respondents have no access. *Woreda* food security work process expert who explain about credit facilities. In this *Woreda* the main sources of credit for rural households according to their level of importance, are Household Asset Building Programme ,Omo Micro Finance Institution and Rural Saving and Credit Cooperatives and other private money lenders who provide credit based on local interest rates. Moreover, the *Woreda* food security coordinators strengthen the expert idea by saying: "many rural households have improved their livelihood system by using credit services." However, most sample kebeles key informants indicate that the credit services are not accessible to improve their livelihood system. That means the availability of services and the rate of interest could not attract to use the credit services. Market facilities are the process of production and distribution of agricultural communities but poor market access affects households.

### *Price fluctuation*

Prioritize the development of low price inputs to increase crop productivity, price bargaining power. Even though, the government tried to provide agricultural in puts at reasonable price, some farmers still are complaining on the price of agricultural inputs. Therefore the government, cooperative organizations and private organizations should give attention on the supply of these inputs on low price, on time and in adequate amount. The government should not leave farmers agricultural products to the interplay of market forces since it is often affected by the fluctuating market price. In this regard, there should be practically applied policies that support farmers to get reasonable price for their perishable vegetable produce to stay and invest more in the sector the price an indication of the extent of the price fluctuation.

### **Conclusions**

Households suffer from transitory and chronic food insecurity problems. Furthermore, the logistic regression model study has shown that the major factors affecting the food security situation of rural households were sex of the households, age of the households, family size, total farm land size, drought, disease and pest condition, livestock holding condition and shortage of improved seed were identified as a major rural households' food security problem in the study area. Study also indicated, livestock holding, land holding size and disease and pest condition have a significant and positive influence on the state of household food security. It is also observed in the study that, livestock rearing has a vast contribution for rural households food security situation while, different challenges prevent farmers to rear different variety and to possess sufficient number of livestock to fill their household food gap. Therefore, harms like shortage of grazing land, shortage of rural credit and disease prevalence problems considered as a livestock rising challenges and significantly associated with households' food security situation. Similarly, survey result indicated that, a number of problems rural households' crop production and productivities are drought, disease, poor improved seed, and low rainfall amount, insufficient land holding size and price fluctuation have statistically significant association with households' food security situation. In conclusion, food security models relate to food availability identified by using household food balance model, food accessibility by using household food insecurity access scale model and food utilization through using household dietary diversity score models are addresses the rural household food insecurity level of the study 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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