Farm Households' Food Insecurity and their Coping Strategies in Arsi Negele District, Oromia Region

Samuel Assefa[1]

Abstract

This paper argues that understanding farm households' perceptions of food security, food security status, its causes and coping strategies across wealth status and agro-ecology are prerequisites to improve food security status and coping ability. The study is based on data collected from Arsi Negele District in 2009. Both quantitative and qualitative research approaches were used. Indicators of wealth status considerably vary across *Kebeles*. Overall, households and community representatives felt residents are getting poorer and food insecure overtime. Female headed households were overrepresented in the poor category. Even though difference was observed in the conceptualization of food security across *Kebeles*, many informants relate food security to sufficiency of own produce. Of the studied households, 84.2% have experienced food shortage. Drought, variable rain, high prices of crops, rapid population growth and its associated diminishing landholding, poor work behavior and poor saving traditions were identified as the main perceived causes of food insecurity. Unlike the recent past years, the impact of drought and variable rainfall were complemented by price escalation to worsen food security situation. To minimize risks and overcome food shortage, households employed panoply of strategies (at a time and sequentially). However, households in different wealth categories employed different strategies. The relatively affluent households cope by their own, while the indigent rely mainly on fellow households, food aid and sale of environmental resources.

Key words: *Farm households, Food insecurity perception, coping strategies, Arsi Negele*

Introduction

In Ethiopia, per capita food output has declined over the last two decades (Astatke, 2002; Drimie et al., 2006). The national production of cereals and pulses in 2007/08, 2008/09 and 2009/10 was 16.6, 17.64 and 16.81 million tons respectively. Even though there was an increase in crop harvest in 2008, 12.8 million people of the country required immediate food assistance for four to six

[1] Lecturer, Department of Sociology, Addis Ababa University

months beginning in August (Famine Early Warning Systems Network and World Food Program, 2008).

This is best explained by the continued increase of prices of food and non-food items. In 2008, the price of cereal (the core of Ethiopian diet) was extremely high as compared to 2007, as well as the five years average. Food inflation accounted for 56% of the total inflation, which was as high as 40% (Famine Early Warning Systems Network and World Food Program, 2008). Food export and the weakness of domestic market (to resist the demand from global market in crisis) also exacerbated the problem. At the household level this significantly reduced food access for the urban poor, poor rural farmers, and pastoral and agro-pastoral populations.

Besides market distortions, other long-established factors are continued to stifle food production, access and utilization among farm households. Particularly fragile natural resource base, inadequate and variable rainfall, population growth and its associated diminishing land holding, inefficient government policies and their implementation, limited access to productive resources, improper farming practices, tenure insecurity, poor health status, low level of education, inaccessibility of transport infrastructure, poor storage technology, poor work and saving behavior are the most cited sources of food insecurity in the country (Kifle and Yoseph, 1999: 69-77; Mulat, 2003:1; Famine Early Warning Systems Network and World Food Program, 2008).

However, farm households' perception of food insecurity and its causes differ. Divergence of perception in a local community is associated with heterogeneity of farm households along wealth status, location/agro-ecology, gender of head etc. This implies that food insecure households respond to the problem and its causes in different ways within the same locality and across localities. Thus, attempts to improve farm household's food security and coping ability needs to be based on a sound knowledge of the decision making behavior of farm households. In this regard, it is imperative to explore farmers' perception of factors of household food insecurity and how households cope with stress under different contexts. Unfortunately, major perceived stresses of food security and farm households' local adaptive and adjustment strategies that have the capacity for becoming the solid basis of sustainable food security has never been studied thus far in Arsi Negelle District. Thus, in this study attempt is made to:

- Assess farm households' perception of poverty, food security and their food security status,
- Explain farm households' perceived causes of food insecurity, and
- Investigate farm households' food insecurity coping mechanisms

Review of Related Literature

Conceptualization of Food In/security

In the 1970s food security was conceived as the adequacy of food supply at global/national/regional level (FAO, 2003). However, the food crisis that has frequently plagued many countries (particularly Sub Saharan Africa), since the mid 1970s and extensively in the mid 1980s and associated debate on food access was accompanied by a paradigm shift. Food security began to be equated with access by all people at all times to sufficient food for an active and healthy life. It was understood that increasing food production, supply and sufficiency at the national level (although important) does not necessarily make households and individuals food secure. This definition encompasses production (food availability), distribution (available food should be accessible by all) and consumption (individuals' food needs are met in order that they remain active and healthy). The available and accessible food to meet individual needs should also be sustainable in time and space. In the mid 1990s, (FAO, 2006) the concept of food security was broadened to include food safety, nutritional balance, food preferences and protected/sustainable use of natural environment. Food security was conceptualized as a situation when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and preferences for an active and healthy life without compromising the productive capacity of natural resources and the integrity of biological systems.

Thus, food insecurity exists when all people do not have adequate physical, social, or economic access to food as defined above. Depending on temporal dimensions, food insecurity could be transitory or chronic (Debebe, 1995). Transitory food insecurity is a temporary decline in a household's access to enough food. It is often triggered by seasonal instability in food supply, fluctuation in food prices and income. Chronic food insecurity is a continuous decline in households' ability either to produce their own food or buy enough food. However, outsider's definition (experts) and insiders (local people) definition could diverge.

Extent of Food Insecurity in Ethiopia

In Ethiopia the food poverty incidence is about 50% at national level, 37% in urban areas and 52% in rural areas (Workneh, 2008). On average, 10.59% of the population was food insecure between 1981 and 2008. Cereals production has been steadily declining on per capita basis. For instance, domestic food production was able to cover only 68.8% and 76.3% of the total national food requirements in 2002 and 2005 respectively (Workneh, 2006). As a result, beginning in the mid-

1970 this gap had to be covered with food aid (Federal Democratic Republic of Ethiopia, 1996).

Destitute peasants, the urban unemployed, people in areas of conflict, pastoralists who depend on markets for cereal supply and refugees from neighboring countries are the major social groups affected by food insecurity in the country (Ministry of Rural Development, 2003). In the Oromia Region alone over two million people were food insecure in 2003, 2005, 2006 and 2009. In Arsi Negele District 18,200 and 11,438 people were food insecure in 2008 and 2009 respectively (Oromia Food Security and Disaster Prevention Bureau, 2009).

Factors of Food Insecurity in Ethiopia

In Ethiopia food insecurity is explained by environmental and socio-economic factors. Particularly, drought, variable rainfall, ruggedness of topography and poor soil are the most often cited environmental factors of food insecurity (Degefa, 2002). However, the effect of environmental factors is triggered by socio-economic factors without being comprehensive including government policies and their implementation, population growth, market distortions, and health and educational status of farmers and shortage/lack of improved agricultural inputs.

The imperial government paid little attention to the agricultural sector in general and smallholder agriculture in particular. Even then due to the feudal land tenure system, interventions aimed at promoting agricultural production benefited landowners to the detriment of the poor rural farm households. This political negligence and the failure to intervene have contributed to the excessive loss of human lives due to starvation between 1972 and 1974 (Kassa, 2003; Degefa, 2005). The Derg on its part abolished private ownership of land, established service and producers' cooperatives and introduced resettlement and villagization programs. Concurrently, another cycle of famine hit the country in 1984 and1985. Even though the current government adopted a strategy (Agricultural Development Lead Industrialization) that put peasant agriculture as a driving force of the nation's economic and social development, regrettably further cycles of famines hit the country in 1999–2000 and 2002–2003 (Degefa 2005). There is also an indication that the current Productive Safety Nets Program has little impact on the asset creation of participants (Gilligan, et al., 2008). Although natural factors, principally droughts, have triggered the scarcity of water causing crop failures and livestock deaths in these famines, the massive death of the population were largely due to government inappropriate policies and failure to mobilize emergency interventions (Degefa, 2005). In addition, the land tenure systems of these regimes are also cited as sources of vulnerability to food insecurity in this country (Yigremew, 1999; Allen, 2000; Mulat, 2003; Girma, 2005).

Moreover, the population of the country had grown fourfold between 1900 and 1988. During the 20th century both population size and its rate had grown rapidly (Girma, 2005: 48). In 2007 (Central Statistical Agency, 2007) the total population of the country was 73,918,505, of which 83.8 % (61, 962,235) lives in rural areas. About 50% (33,248,021) were under 15, while 14.6% (10,785,103) were below the age of 5. This rapid population growth and high dependency ratio is one of the major causes of the on-going food crises in the country. Rapid population growth leads to natural resource base degradation, diminishing of resources (land, water, GDP, etc.) and consumption of capitals generated by the economy. At household level, it reduces per capita land available for farming, hindering households with small plots to produce enough grain to meet their consumption.

Besides, even though attempts have been made at different levels, farmers and pastoralists are still only loosely connected with the marketing systems. Most of the agricultural productions in the country are not linked with domestic and international market (Getahun, 2003:27). Even then they are paid less than the value of their outputs. Conversely, since 2008 farm households that rely partly on purchase of staple food are suffering from the unexpected price escalation of consumer and non- consumer goods. In most parts of the rural areas of the country, farmers still have low access to inputs, outputs, credit and land market. The transport and communication systems are also far from being adequate to ensure a quick distribution of agricultural inputs and efficient marketing of agricultural products. This forced them to adhere to the archaic farming tools and implements (Mulat, 2003: 6-8; Getahun, 2003: 27).

Health, education and nutritional status of the people are both causes and consequences of food security. In this country, adult illiteracy is a major bottleneck in developing agriculture; acquire available food through generation of income and proper utilization of accessible food. It is estimated that 64% of children under the age of 5 are stunted. Communicable diseases such as malaria, tuberculosis and diarrhea, account for 60 to 80% of all diseases in the country (Mulat, 2003:12).

Farm Households' Food Insecurity Coping Mechanisms in Ethiopia

Farm households adopt different strategies to mitigate the effect of food shortages. However, the strategies vary depending on the nature and intensity of shocks on the one hand and on the households' own condition on the other. Farm households adopt strategies that have little long-run costs earlier, while strategies with higher long run costs that are difficult to reverse are adopted later. In time of food shortage farm households employ a portfolio of strategies that include: livestock sales, agricultural employment, off-farm employment and migration to other areas,

requesting grain loans, sale of wood or charcoal, small scale trading, selling dung and crop residues, reduction of food consumption, consumption of wild plants, reliance on relief assistance and relying on remittances from relatives (Yared 2001 cited in Markos, 2005; Degefa 2002).

Conceptual Framework of the Study

The study used a modified form of sustainable livelihood framework to understand factors that lead rural farm households to food insecurity. As indicated in Figure 1, a number of factors are closely interconnected to impact a rural household's food security situation. A household's access to natural, physical, human and financial capitals is a prerequisite in an effort to engage in productive activities. Access to these capitals is influenced by endogenous (e.g. gender relations, institutions and organizations) and exogenous (e.g. land policy, shocks) factors. These determine the choice of particular livelihood activities. A household could be food secure or insecure depending on the viability of their livelihood activities (Ellis, 2000). Food insecure households employ coping strategies that could drain their asset base, while food secure households maintain/improve their asset possession.

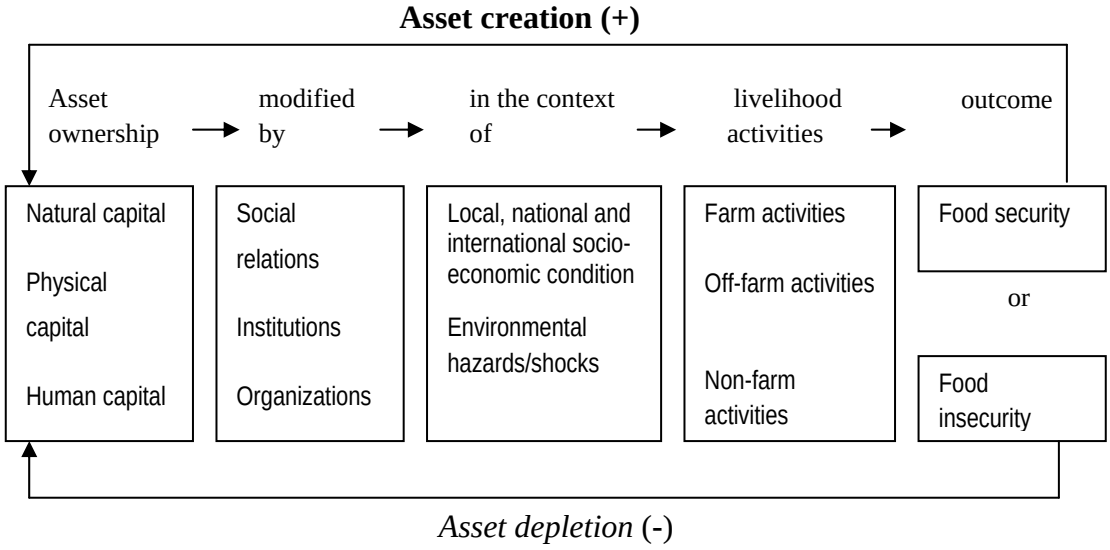

Figure 1: Conceptual Framework of the study

The Study Area and Methods of the Study

The Study Area

The Arsi Negele district is located in the West Arsi Zone of Oromia Regional State. The capital of the district, Arsi Negele, is 225 km away from Addis Ababa. Geographically, it is located within grid coordinates of 7^0 08' 00'' N to 7^0 49' 00'' N latitude and 38^0 24' 04'' E to 38^0 48' 09''E longitude and its altitude ranges from 1500 to 2300. The total population of the district is 264,314 (211,985 rural and 52,329 urban residents) (Central Statistical Agency, 2007). During this study there were 43 rural and 4 urban *Kebeles* in the district. Among these *Kebeles*, Shopha -bultum, Qararu and Raffu-hargissa were selected, in view of their agro-ecology, distance from the district town and access to transportation facility. Shopa-bultum is mainly *dega* and partly *woina dega*. It is far away from the District town and had no access for transportation facility. Raffu-hargissa is mainly *woina dega* and partly kola. It is closer to the district town and had access for transportation facility. Qararu is within *Kolla* agro-ecology and had access for transportation facility (Figure 2).

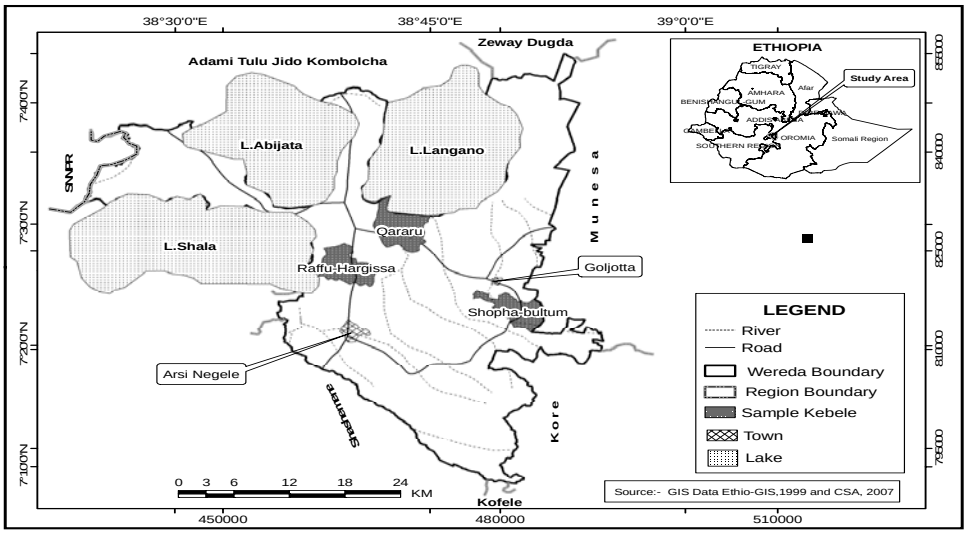

Figure 2: Location Map of the Study *Kebeles*

Methods of the Study

The study employed both quantitative and qualitative research approaches. Wealth ranking exercises were done with three individuals (2 men and 1 woman) who were considered knowledgeable of wealth status of households in each *Kebele*. The exercises were used to identify local perception of wealth, households' resource, vulnerabilities and coping ability of different groups. Key informants interview were conducted with development agents, elderly and District Food Security and Emergency Unit expert to gather data on access to assets, the role of existing formal and informal institutions including market, attitude towards government programs, etc. The total number of informants was seven. Focus Group Discussions (FGD) were conducted with twenty two women participants to collect pertinent data on the perception of women.

Household survey was employed to gather data on households' perceived causes of their food insecurity and their coping strategies. A proportionate stratified systematic sampling technique was employed to select 146 households from 1459 households in the sampling frame - prepared based on data obtained from each *Kebele* administration. To select the sample, households were stratified first by their wealth status (determined through wealth ranking exercises) and then by gender of household head to ensure the proportionate representation of households from different wealth and gender categories. A structured questionnaire was employed to generate both quantitative and qualitative data. The household heads – usually men, were the main respondents of the questionnaire. The questionnaire was pilot tested before the actual fieldwork was undertaken.

Data obtained from key informants, focus group discussions and wealth ranking exercises were analyzed qualitatively, while those obtained through household survey was analyzed both quantitatively and qualitatively. SPSS v12 for windows was used to generate descriptive statistics. Data obtained from secondary source were analyzed both qualitatively and quantitatively.

Results and Discussions

Households' Wealth Status

Farm households' in the study area were heterogeneous along many variables. They differ in demographic characteristics, asset possession, access to off-farm and non-farm income sources and even ethnicity and religious domination. This suggests that households differ in their perception of shocks, vulnerability and thus coping strategies. The wealth ranking exercises show that the criteria of what constitute wealth considerably vary between *Kebeles*. As such households differ in their vulnerability to potential risks since coping ability with livelihood risks

depends on possession/wealth status. However, all groups of informants indicated that compared to earlier times, residents are getting poor. They related their poverty to rapid population growth, diminishing farm and grazing land, and frequent incidence of covariant shocks (drought and erratic rainfall). All participants of wealth ranking exercises (in the three *Kebeles*) classified households to three wealth categories: rich, medium and poor.

In Shopha-bultum land size, size of livestock ownership and amount of crop outputs were the main criteria informants used to rank households. Oxen ownership, ownership of tin-roofed houses, education (head and children), food security and access to irrigation scheme were also raised as indicators of wealth in the area. Conversely, households with larger family size and women headed households were classified to poor category. Out of the total 542 households in the *Kebele,* 65 households were classified to rich category (61 male and 4 female headed), 190 to medium category (171 male and 19 female headed) and 287 to poor category (208 male and 79 female headed).

In Qararu, food security status was the main criterion used by informants to assign households to different wealth categories. Land ownership was also well recognized by informants. However, they emphasized the quality of land (sand, salty soil, agricultural) than its size. Better size of cattle and goats, access to irrigation scheme and participation in off-farm activities were also raised as indicators of wealth in the area. On the other hand, households who sale or trade salty soil, members of fish cooperatives and daily laborers were categorized to the poor category. Out of the total 295 resident households, 12 were identified as rich (11 male and 1 female headed). Medium households were 79 (75 male and 4 female headed households). Households that were assigned to the category of poor were 204 (168 male and 36 female headed).

In Raffu-hargissa, out of the total 622 households, 29 were assigned to the category of rich (28 male and 1 female-headed), 250 were regarded as medium (210 male and 40 female headed) and 343 were regarded as poor (231 male and 112 female headed) households. Similar to Qararu, food security status was the main criterion of differentiation. Larger farmland size, location in the *woina dega* area of the *Kebele*, participation in pepper production, ownership of livestock, and ownership of donkey carts were also important criteria used by informants to categorize households to the better off category. Conversely, households headed by female and old persons and households that sale salty soil were categorized to the poor category.

Results of wealth ranking exercises in the three *Kebeles* clearly show that (1) female-headed households were overrepresented in the category of poor. (2) What people consider indicators of wealth differ across *Kebeles*. (3) Even if the criteria were the same such as land and livestock size, the quantity and quality differ

across *Kebeles*. (4) Households in Shopha-bultum appeared better off compared to Raffu-hargissa. Raffu-hargissa was better off than Qararu. It seems therefore that households in Qararu were more vulnerable to covariant shocks (drought, erratic rain, prices etc.) than Raffu-hargissa. Households in Shopha-bultum appear less vulnerable to these shocks.

Perception of Food Security

It is important to explore local people's definition/perception of food security as this tends to differ from expert/outsiders definition. However, rural farm households themselves differ in their perception of the essence of food security. Men and women differ in their conceptualization of food security. Even the views of these groups differ across *Kebeles*.

For elderly in Shopha-bultum, food security is related to own produce that is sufficient for both dry and wet seasons. The availability of sufficient and timely rain that enables the planting of crops and pasture generation was another indicator of food security. A household that does not resort to other sources, except own produce, is regarded food secure. Those who sale important livestock, engage in menial activities for food are not considered food secure. Hence, households that resort to loss management strategies are considered food insecure. Women in Shopha-bultum related food security to situation where families store sufficient grain in their house. They also related food security to situation when children get sufficient milk and adults are not subjected to reduced amount of food. Elderly and women in Raffu-hargissa and Qararu, on the other hand, stated that households face food insecurity when amount of own produce food fall off and when market price of grains rise particularly during summer (as in 2008). They argue that food insecure households are households that lack farmland to produce sufficient food that is enough for all months and lack financial capacity to purchase grains from local markets. Households that obtain food through presumed aberrant behaviors encompassing borrowing, begging, cash loan, support of relatives, cheating, sale of labor etc. were considered food insecure. A household that obtains food through own effort (produce and purchase through the sale of other crops and livestock) were considered food secure. In general, farmers associate food security with adequate supply of grain obtained mainly through own production and ability to purchase food on the market by generating income from non-deviant activities.

Households' Perceived Food Security Status

In order to capture farmers' perceived food security status, two questions were posed to studied households. First, they were asked if own produce met their annual food requirement. Out of 146 sample population, only 12.3% have reported they obtained sufficient food from their own crop and animal production to cover all year round demand. The difference between *Kebeles* is low as observed in the column percentages. However, the proportion of households in Shopha-bultum slightly exceeds Qararu and Raffu-hargissa (see table 4).

Table 4: Sufficiency of own produces and experience of food shortage in the last one year, by *kebeles*

Kebeles	Own produce sufficient?				Experienced food shortage?			
	Yes	%	No	%	Yes	%	No	%
Shopha-bultum	9	16.7	45	83.3	43	79.6	11	20.4
Qararu	3	10	27	90	27	90	3	10
Raffu-hargissa	6	9.7	56	90.3	53	85.5	9	14.5
Total	18	12.3	128	87.7	123	84.2	23	15.8

Respondents were also asked whether they faced food shortage in the last one year. The responses were consistent with sufficiency of own produce (see table 4). This indicates that farmers in the study area mainly relate food security to sufficiency of own produce.

Sustainability of Households' Food Security between Months

To assess the sustainability of food at household level, respondents were asked to rate their food security status as never, moderate, or severe in each of the months of 2008. In general, period of harvest and post-harvest were generally periods of affluence, while seasons of plantation and pre-harvest were periods of food shortage. December, January, February and March appeared to be months of relative food sufficiency in the study *Kebeles*. Particularly in January and February

only 15.8% (2.1% severe) of households reported they have faced short supply of food. In contrast May, June, July, August and September, were months of food shortage for 74.6% (30.1% severe), 82.9% (46.6% severe), 79.49% (54.79% severe), 80.3% (61.1% severe) and 74% (32.23 severe) of households respectively. In terms of severity, July and August appeared to be the worst months since 54.8% and 61.1% of respondents said they have experienced severe food shortages respectively.

In order to discern differences that would exist between *Kebeles* the total numbers of households that faced food shortage (moderate and severe) and total number of household that faced severe food shortage in the worst months were used. Accordingly, in Shopha-bultum during September, 94.4% of sample households faced food shortage (out of which 74% were severe food shortages). In Qararu during August, 96.6% of households faced food shortage (out of which 90% were severe food shortage). In Raffu-hargissa during the month of June, 82.2% of sample households faced food shortages with severe food shortage reported in the month of August. This indicates that in the presumed worst months, Qararu had the highest number of food insecure households, followed by Shopha-bultum and Raffu-hargissa in that order.

The type and quality of food intake between months is also taken as an indicator of sustainability of food security. In good times/the period after harvest, elderly and women stated that x*orosho (*locally prepared bread made of maize, wheat and sometimes barley*),* porridge, bread, *injera,* etc., are used as staple foods. This trend continues not for more than four months for most households. Consumption of less preferred foods begins during plantation and the quality of food gradually declines until the next harvest. Potato, *enset*, cabbage and *dobbii* (a type of plant grown mainly in highlands whose leaf and steams are consumed*)* were some of the less preferred foods consumed during bad months in Shopha-bultum. Households in Qararu and Raffu-hargissa typically rely on haricot beans during rainy seasons.

The pattern of food ration among individuals in the household in the dry/good seasons and wet/bad seasons, which has food utilization dimension, is also illustrated by informants and FGD participants. An elderly key informant in Raffu-hargissa, for instance, states that:

Afaan Oromo	**Gloss**
Namnii guddaan akkaa hin duune nyataa	older people consume food just for survival
Dargaggeessi akka Quufutti nyaata	youngsters eat for corpulence

Daa'immaan akka duututti nyaati children are fed because food is their life

This indicates that children get priority for food especially during bad times. Young members of households are second in the priority list. Older people are least prioritized. This is also confirmed by the information collected from women FGD participants. However, they added that there is no discrimination between children by sex. One of the FGD participants in Shopha-bultum states that 'when I serve some food to my husband, sometimes he even doesn't test it; he divided all among the children in the house. They are always the first in food with what we have during both *bona* (dry seasons) and *ganna* (wet seasons)'. Regarding other adult members, in good times husbands and males are served before women could eat. However, during bad times male particularly older members are not given much attention. In all circumstances, even though females prepare food, they always give priority to others than themselves.

Households' Perceived Factors of Food Insecurity

In order to identify farm households' perceived causes of food shortage, data obtained from different informants are categorized in themes and used. Besides, sample households' perceptions of causes of shortage were selectively used to substantiate the findings of qualitative data. To this end, following the conceptual framework of the study factors that would affect the production, access and utilization dimension of food security were presented to respondents to rank their influences. For the sake of convenience issues raised by informants and respondents were categorized under demographic, environmental, economic, infrastructural and socio- cultural constraints.

Perception of Demographic Constraints

Farmers view rapid population growth and its associated diminishing landholding and land fragmentation as the main constraints of food security. For 89% of households, diminishing landholding was the main bottleneck of food availability. Households who related food shortage to rapid population growth constituted 82.2%. All informants raised diminishing landholding as the main factor of reduced crop output per household. Paritable inheritance was mentioned as the main factor of land fragmentation. An elderly in Shopha-bultum stated that 'land is the main resource that we could pass to our children. But today most lack it. Even then we are giving very small plots of land to our children than we inherited from our parents. In this way we are creating very poor children'. At household level

increases in family size reduces per capita food consumption. The effect of population pressure on food security by dwindling environmental resources (e.g. forest and soil) is also apparent.

Perception of Environmental Constraints

Drought and Variable Rain: Drought and erratic rainfall pattern were viewed as the main constraints of attaining food security for 99.3% and 89.7% of households respectively. Discussions held with Development Agents (DAs), the elderly and women informants indicated that drought and erratic rains were the main causes of food shortages for the majority of households in their *Kebeles*. In 2008 the dry season was expanded even to the relatively wet areas of Shopha-bultum. Due to lack of animal pasture, informants said, many livestock died; especially the loss was devastating for cattle herders in the *dega* area. Besides, absence of *belg* rain hindered the cultivation of potato, which would have been used pass through the lean rainy season. In Qararu and Raffu-Hargissa, informants said that the rain started very late and stopped early on the germinating crops. This highly reduced the amount of households' crop output. Some households entirely lost.

Diseases (Animals and Crops) and Weeds: The elderly and women related the cause of animal and crop diseases to drought and variable rains. Particularly, in *dega* area of Shopha-bultum after the rain comes animals were affected by distension. Farmers view crops and animal diseases as the second major constraints affecting their agricultural production and productivity following drought and erratic rainfall pattern. Households that felt animal diseases and crop diseases were one of the factors of their food insecurity constitute 50.7% and 49.3% respectively. About 34.9% of households regarded weeds as the major constraints to their agricultural production.

Rugged Topography and Poor Soil: The direct impact of relief on agricultural production through its influence on soil productivity and application of fertilizer was also recognized by farmers. Out of the total sampled households 44.5% indicated that the ruggedness of the topography was a constraint to their agricultural production and productivity. However, the problem was more felt among Shopha-bultum respondents. This seems sagacious as the *Kebele* is located to the east of the district town in the escarpment of the main Ethiopian rift valley. Poor fertility status of farmland as a constraint of agricultural production was well recognized by 54.8% of respondents. Though development agents in Shopha-bultum regard the soil in the *Kebele* was fertile, the elderly and women emphasized poor soil as constraints of agricultural production. Strengthening this argument a FGD participant said that the weather condition in *dega* area is favorable for only

barley and beans. Even then, their productivity is low (e.g. 4 quintals per *olcha* for barley). In Qararu and Raffu-hargissa, the elderly and DAs commonly argue that the soil is not favorable for crop production. In Qararu, the soil is mostly sandy and has low water holding capacity. In Raffu-hargissa, the saltiness of soil, especially on the northern and western side of the *Kebele* was the main challenge of agricultural production.

Perception of Economic Constraints

Farmers were exposed to drought and variable rainfall in the mid of the longstanding (lack of off-farm income source, low utilization of modern agricultural inputs, shortage of oxen) and emergent (price escalation) economic constraints. In 2008, the price of food and non-food items increased unexpectedly. Of the studied households, 95.9% view price escalation as the main constraint of their access to food. This seems bizarre as this is thought to affect urban poor and pastoralists who cannot purchase staple food at inflated prices. However, informants stated that farmers in the study area were affected in much the same way as non-food producers. Firstly, price escalation affected farm households' through the loss of purchasing power. This particularly affected the poor who depend on purchase of some food from market and who cannot produce food all year round. It also affected households who mainly obtain food through the sale of livestock, particularly those living in *dega* and *woina dega* areas of Shopha-bultum. Others also argued that all rural farm households were affected, as the price of all goods and services were more inflated than grains had. A FGD participant in Qararu asked if anyone is self-sufficient from his or her own produce. She said that one has to purchase salt, sugar, pepper, edible oil, pay for health services, rent houses for children in towns etc., for which the market prices were inflated than food grain was. Secondly, there was miscalculation by some better off farmers. Informants argued that usually the market price of grains is cheap immediately after harvest. It gets expensive until next year's harvest, the extreme usually reported in July and August. In 2008, in an unusual way, the market price of grains rose immediately after harvest. This change in trend made the future unpredictable for farmers. The relatively better off farmers were forced to sale out their produce at the relatively high price they have imagined after harvest. For instance, an elderly from Shopha-bultum stated that:

> *As the price of crops increased unexpectedly around April and May from 250 birr to 450 birr for wheat, some farmers sold their output panicking lower prices in the latter months. But this price continued to rise and reached 750 birr around August. The price was unaffordable. Most can't buy even*

sorghum. I myself sold one heifer for 850 birr and managed to buy only one quintal of maize for 650 birr for my family.

Moreover, 74% and 80% of households viewed absence of off-farm income and traditional farming implements and practices as constraints to improving their food security status. However, off-farm activities were relatively accessible to households in Qararu such as sale of sand (for males) and sale of salty soil (for female). On the whole, compulsory forms of diversification were seen in the study area. Besides, respondents that see low use of modern farm inputs and shortage of farm oxen as obstacle to agricultural production constituted 67.1% and 62.3% respectively. This indicates that farmers were worried about their inability to use modern agricultural inputs. But lack of finance and untimely arrivals were raised as major challenges of utilization. It is also apparent that shortage of farm oxen adversely affects the cultivation and amount of output. However, the problem was more prominent among poor farmers. Absence of oxen hinders proper and timely preparation of farmlands. In order to get access to this important resource households have to either rent out their land to other farmers or have to get on rent or get on exchange of their output or labor. In any case farmers have to lose some amount of their produce.

Perception of Infrastructural Constraints

Inaccessibility of Roads: Access to agricultural input and output through purchase is largely influenced by access to all weather roads. Among the study *Kebeles*, Qararu and Raffu-Hargissa had access to all weather roads. Shopha-bultum had no access to all weather roads. Predominantly, communities residing in *dega* area were marginal. On the whole, inaccessibility to roads was felt by lower proportion of households (37.7% of households). However in Shopha-bultum, 90% of households felt absence of road as a major constrain of access for markets (inputs and outputs) and social services.

Low Access to Market Places: Physical access to market plays significant role in the livelihood of rural farm households. During this study farm households in Qararu had no physical access to even small local weekly market. The market they had was Alambada (costs 5 birr for a single trip through public transportation) or the district town (costs 10 birr for a single trip through public transportation). For residents of Raffu-hargissa, the available market place was the district town (costs 3 birr for single trip through public transportation). Shopha-bultum on the other hand had access to one weekly market on Tuesday. The district town is too far

away (some 9- 10 hours on foot). The lack/inefficiency of market profoundly affects the livelihood of farmers in the long run. For instance, an elderly in Shopha-bultum said that onion, tomato and potato were widely cultivated in the *woina dega* areas of the *Kebele*. However, in the recent years people stopped to cultivate these vegetables as the market is inaccessible and their prices get cheaper during harvests. He remembered the occasion when the price of a quintal of potato was lower than its cost of transportation to the market (Arsi Negelle town).

Inadequate Extension Services: Households that complained the inadequate extension services provided by development agents constituted 93.2%. In fact, DAs themselves admitted the inadequacy of their services. Instead they raised absence of incentives and motivation for staying in rural areas as the main reason of insufficiency of their services. There was no curriculum for further education and system of salary increment with service years for development agents. They also raised quarrel with *Kebele* leaders - on distribution of food aid and management of farmers' demonstration site - as obstacle to their services. During this study, in Shopha-bultum, the *Kebele* administration has already given farmers demonstration site for sharecropping considering that the land was left idle for many years. DAs argue that the land turned to wilderness because farmers in the area were not willing to work on the sites. Consequently, all informants raised the insignificant role of DAs in their community. DAs themselves agreed that they have never visited farms of any households except in rare cases. They had no schedule on when to do what. They lack zeal of work. For instance, during this study, some DAs were attending distance education to get out of the profession that they consider boring. The lack of close monitoring on the side of concerned bodies also contributed to the overall inefficiency.

Absence of Irrigation and Credit: Farmers felt that their dependence on rain-fed agriculture and their failure to utilize irrigation have considerably affected the size of their crop harvests and their food supplies. That is why 78.8% of households regard absence of irrigation as important infrastructural constraint in attaining food security. They also viewed access to credit as a means to compensate their cash deficiency. Out of 146 households, 89.7% see that their access to farm credit would promote their agricultural production and enhances their engagement in off-farm and non-farm activities. The advantage of credit was more felt among farmers of Qararu and Raffu-hargissa. In Qararu, all respondents regarded absence of credit as one of the impediments of promoting farm, off-farm and non-farm income. In Raffu-hargissa respondents that regarded credit as important source of cash deficiency constituted 95.2%.

Lack of Pasture and Veterinary Services: Livestock production and productivity depends on the availability of sufficient quantity and quality of pasture and veterinary services. However, in the study area, this sector suffers from both lack of grazing land and diseases. Households that view lack of pasture and veterinary services as limiting factors of production and productivity constituted 82.2% and 80.8% respectively. Both lack of pasture and veterinary services were more felt in Raffu-hargissa. Households that viewed lack of pasture and veterinary services as constraints of livestock production and productivity constituted 98.3% and 95.2% in the *Kebele*. The lack of veterinary services was compensated by the use of traditional medicines and practices such as kerosene, burning puff areas of livestock, etc.

Perception of Socio-Cultural Constraints

Low Level of Education, Health Problems and Shortage of Human Labor: The studied farmers felt that their low level of education has adversely affected their agricultural production, decision-making on market, management of harvested crops and income generation from other sources. Households that felt their low education level is responsible for their seasonal food shortage constituted 80%. During this study all studied *Kebeles* had second cycle primary school (1-8). However, students must go to the District town for secondary education. Even then, the direct impact of children's education on agricultural production is limited. Even though farmers' training centers are claimed to narrow this gap, a farmers' training center was available and functional only in Raffu-hargissa. On the other hand, households that regard their poor health and physical conditions have affected their agricultural production constituted 68.5%. Discussions held with the district health bureau personnel suggest that typhoid fever, intestinal parasites, pneumonia, diarrhea and tuberculoses were the major diseases diagnosed among residents of Shopha-bultum. Malaria and diarrhea were prominent in Qararu and Raffu-hargissa. Informants indicate that people usually get sick during wet seasons (when agricultural labor is highly demanded) because of amenities of the weather for disease causing insects (e.g. mosquitoes) and lack of balanced diet. The health service delivery was regarded poor on many accounts. Households in Shopha-bultum have to visit Goljota health center (an hour and half by foot) as there was no health services in the *Kebele*. Qararu has one public and one private lower level clinic. Farmers in Raffu-hargissa have to travel to the district town to get any kind of medical treatment. However, all informants in all *Kebeles* complained about the quality of services provided by public health institutions. On the whole, because of health problems and other factors 59% of respondents viewed shortage of human labor as a major constraint to their agricultural production and food security.

Poor Work Behavior: The elderly, DAs and women commonly regarded poor work behavior of farmers as impediment of household food security. They stated that poverty and food insecurity are associated with poor work discipline, lack of motivation and commitment in work, poor self-control and poor management of own livelihood activities. DAs particularly emphasized that food secure households are often hard workers, farsighted and industrious, while food insecure households showed less work discipline, perseverance and venturing. They stated that farmers usually employ laborers, from Wolita and Kambata areas than working by themselves. Besides, farmers consider off-farm and non-farm activities menial. They resort to this activity if food and income drawn from livestock and crop production fails. Particularly, people who are employed by fellow farmers are still socially discriminated. In order to engage in presumed menial activities landless farmers have to leave their communities.

Poor Saving Tradition: Out of 146 sample population, 65.1% viewed poor saving tradition as one of the factors of their seasonal food shortage. Of the total grains, sample households obtained through different mechanisms, 3.15% was used for social obligations. Of the total livestock owned at the beginning of 2008, 1.4 % was used for social obligations. Of the cash income generated from different sources, 14.2% was used for social obligation. On average households spent 73.5 kg of crops, 0.0627 Tropical Livestock Unit (TLU), and 588.44 birr for social obligations in 2008. Using own resource for social obligation is not wrong per se but the type of social obligation needs to be considered. In the study area farm households' purpose of resource transfer can be categorized into three: *social stress management* (health problems and food shortage), *marriage ceremony*, and *death of close relatives*. The contribution of resource transfer in coping with stresses is explicable. The extravagant use of resources for marriage and death ceremonies has detrimental effect not only on households concerned but also their close relatives. The elderly and DAs, also relate food shortage to alcoholism. These practices are assumed to take a significant proportion of farmers' produce every year.

Tenure Insecurity: In order to assess farmers' perception of current land tenure arrangement and tenure security four questions were posed to respondents. Firstly, households were asked to whom they think the land they were using belongs. 60.3% (88) reported that land belongs to the government, while 39.7% (58) felt that land is their own property. Secondly, they were asked if they feel land will be redistributed in the future, 69.9% (102) households felt land redistribution will not happen in the future, while 29.5% (43) were not pretty sure that land redistribution

would not happen in the future. Thirdly, they were directly asked if feeling of future land redistribution is discouraging them from investing on and care for the land, 93.2% (136) of the households indicated that they were using land without reservation, while only 6.8% (10) said they were constrained. Finally, farmers were asked if absence of land market affects them in any way. Absence of sale of land was constraint for only 26% (38) of households, while for the remaining 74% (108) of households absence of land market was not considered as a problem. In fact, discussions held with informants indicate that land is a locally exchanged commodity (both complete sale and rent). From this discussion it seems that the prevailing land tenure arrangement neither prohibited land market nor discouraged farmers from investing on the land.

The above mentioned factors interact with each other to negatively affect the availability, access and utilization dimensions of food security. Extended drought seasons, variable rainfall pattern, animal and crop diseases, and price escalation of crops were added with longstanding factors to exacerbate food insecurity in the study community. These factors were felt differently across *kebeles (*e.g. ruggedness of topography and physical access to market in Shopha-bultim, poor soil and recurrent drought in Qarraru and Raffu-hargissa, etc*.)*. However, no significant difference was observed across wealth status. Thus, it can be argued that even though longstanding factors (e.g. oxen, livestock, size of farm land, etc.) continue to differentiate households along wealth status and food security status, covariant shocks (drought, variable rainfall and price escalation) have partly blurred the expected perception difference. Moreover, since perception is socially embedded, respondents could report not only their own conditions but also their perception of the communities concerned.

Household Food Insecurity Coping Strategies

It has been said that variability and risks are matters that farm households have to live and cope with. Which strategy is best for an individual household, however, depends on the available resources, weather conditions, market availability and other factors. As these factors change and are context sensitive, the best strategy is also likely to change. Hence, response to risks such as food shortage by an individual household is dynamic in nature. Moreover, the strategies employed by different households do vary at one particular time (based on wealth and agro-ecology). Consequently, attempt is made to explore households' response to food shortage under different wellbeing status and agro-ecologies as the analysis of aggregate farm households coping strategies alone is inadequate. For the purpose of convenience, following Frank Ellis (2000) coping strategies are categorized into

two broad categories: *risk minimizing strategies* - action taken by households to reduce the occurrence or magnitude of food shortage and *loss management strategies* - actions households take after experiencing food shortage.

Risk Minimizing Strategies (ex-ante)

To minimize risk, farm households grow different crop varieties and species (food and cash). They also plant crops that have different maturation periods. Planting crops in different locations with varying agro-ecology (on own plots or relatives') and growing a wide range of varieties of a single crop were also other widely practiced mechanisms of diversification. However, wider options of diversification were accessible to resource rich farmers, particularly ownership of farm and grazing land in different agro-ecology was found to be important. Diversification was also found to be influenced by labor availability and health, seeds, drought, power, and access to irrigation which poor farmers usually lack.

Moreover, in the study area marriage arrangements usually involve the calculation of benefits for couples and their parents. Households usually prefer to establish marriage relationships with families (*gossa*) in a different agro-ecology from their own. Relatively wet areas are always prioritized. This relationship is thought as insurance for livelihood risks (drought, variable rain, food shortage, etc). Resource transfer between marriage related families is very effective since it depends on mutual respect. Farmers also establish *harmaa* - literally means *breast*, to overcome problems that would be posed by livelihood risks. *Harmaa* is a friendship between two households who have no blood or marriage relationship. In most of the cases households establish *harmaa* with households in distance places. Difference in agro-ecology is usually preferred. Relationship established through *harmaa* is very strong and sometimes end up with marriage relationship. However, informants indicated that informal social transfers through in-laws and *Harmaa* are abating because of resources constraints. However, still today under severe food shortage in - laws and *harmaa* are good places available for average households to migrate entirely to, send part of livestock and household members.

Loss-Management Strategies (ex-post)

Household's response to lower than expected own production (livestock and crops) due to natural hazards and its associated perception of food shortage is categorized under loss management strategies. Only unusual behaviors or strategies employed for the sole purpose of overcoming food shortages are presented to households to rate as never used, occasionally used and frequently used. Point score analysis is used to assess both the widely employed strategies as well as variations in households (wealth status) in use of these strategies. It is calculated by assigning a

value of zero for never used, one for occasionally used and two for frequently used. This was multiplied by the number of responses and then summed up.

Intentional Loss of Appetite: Reduction of food consumption in terms of both the number of meals per day and amount of food in a meal was the intensively and extensively used strategies among the interviewed households. The proportion of households that reported they have reduced the quantity of food due to food shortage was 95.2% (139), while those who reported that they reduced the number of meals (skipped meals) due to food shortage were 95.9% (140) of the households. Aggregately reducing number of meals and quantity ranked first and second respectively. This partly indicates self-deprivation from food is the easiest and first strategy farm households employ. However, it was less used among better-off farmers (see Table 5).

Use of Seeds and Cash Reserved for Bad Times: Under normal circumstances farmers rarely if any use seed reserve and cash saved for bad times. It is only under severe livelihood hazards – food shortage and absence of other options that they resort to these sources. In the study period, households that used cash reserved for bad times and seeds due to food shortage constituted 82.2% and 81.5% respectively. These strategies were the second options available for households, following intentional loss of appetite. However, these strategies were more often employed by better-off farmers, than moderate and poor farmers as they in the first place lack these resources.

Reducing Household Size: Adjustment of household size is another common coping strategy by the poorer households in the study area. The objective is to reduce family size towards smaller consumption units as well as making it possible for vulnerable groups such as children to access food. This is usually achieved by sending children to in-laws, *harmaa* or relatives in towns. Households that reported they sent their children to relatives due to food shortage constituted 44%.

Table 5: Point score analysis for households' use of different coping strategies by wealth status

Coping strategies	Rich		Medium		Poor		Total		% of HHs using
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	
Reducing numbers of meals	9	3	57	1	114	2	180	1	95.9
Reducing amount of food consumption	9	3	55	2	144	1	179	2	95.2
Use of reserved seeds	12	1	46	4	72	3	130	3	81.5
Use of past cash savings	10	2	47	3	69	4	126	4	82.2
Receiving food relief from aid agencies	2	9	16	7	50	5	68	5	43.2
Sale of livestock (other than ox and cow)	6	5	25	5	29	12	60	6	39
Borrowing food or cash from neighbors or relatives	2	9	11	9	47	6	60	6	32.2
Receiving credit from merchants or money lenders	3	7	10	10	43	7	56	8	31.5
Work as casual laborer	3	7	5	8	37	9	55	9	30.8
Changing dietary habits	2	9	7	12	43	7	52	10	32.2
Sale of productive assets (ox cow, land)	5	6	20	6	21	15	46	11	30.1
Sending some children to relatives	0	11	5	16	39	8	44	12	23.3
Rent out land	2	9	10	10	31	11	43	13	27.4

Migration of the entire household in search of relief	0	11	6	15	32	10	38	14	19.9
Sale of wood	2	9	15	12	26	13	35	15	20.5
Sale of fire wood	0	11	7	12	26	13	33	16	19.9
Sale of charcoal	0	10	5	16	10	16	15	17	9.6

Sale of Productive Assets and Small Livestock: Households that sold livestock (other than oxen and cow) due to food shortage constituted 39%, while those who sold productive assets (oxen, cow and land) were 30% of the households. As indicated in Table 5, the frequency of sale of small animals was more than productive assets. Sale of productive assets was seen more among medium farmers, while sale of livestock (other than oxen and cow) was more accessible to better off and medium farmers. This could be attributed to low access of poor farmers to these resources. However, renting out land is more often seen among poor and moderate farmers than better-off farmers. However, these strategies tended to vary across *Kebeles*. In Raffu-hargissa, sale of productive assets and small livestock as coping strategies of food shortage was less employed than other *Kebeles*. Conversely, renting out farmland during food shortages was very common in this *Kebele*. Their main clients being better-off farmers in the community, urban based part-time farmers and Kambata community.

Local Credit systems: Two types of credit systems were seen in the study area. First, households that face food shortage borrow grain or cash from neighbors or relatives. However, sometimes farmers' introvert behavior was found to be obstacle in using this strategy. Unlike earlier times the repayment of borrowed cash and grain was paid back with interest. One quintal of grain received during wet seasons was paid in two or three quintals in the next harvest season. Sometimes households that face food shortage receive some cash or grain from better off farmers to work on harvest in the coming season. However, the value of exchange was usually very low compared to normal times. Out of the total sample households, 32.2% had borrowed grains and cash from relatives and neighbors to overcome problems of food shortage in 2008. Second, households that experienced food shortage received credit from merchants and/or moneylenders. In order to receive this credit, a farmer should be known for his/her discipline and trustworthiness or have to have some collateral. Its interest rate was also by far

higher than credit received from neighbors/relatives. Households that resorted to these sources of credit due to food shortage constituted 31.5%. Receiving credit from merchants and relatives/neighbors was more often used among poor and some moderate farmers in Shopha-bultum than in other two *Kebeles*.

Relying on Relief Food and Changing Dietary Habits: Households that relied on food aid (food relief and safety-net) obtained from governmental or non-governmental organizations constituted 43.2%. It is ranked fifth (see table 5). However, this source of food was not available for Shopha-bultum. Households that reported their members have changed dietary habits or relied on less preferred and/or unconsumed food, due to food shortage constituted 32.2%. As indicated in table 5, better-off households used this strategy rarely.

Engaging in Petty/Menial Works: Households that faced food shortages also resorted to menial works that include: casual labor, sale of wood, firewood and charcoal. Poor farmers in Shopha-bultum usually engage in sale of wood and firewood. However, the use of these resources was very tough. It requires good health and physic. Farmers had to enter forest (Gara-bultum) during night, as the forest is under protection during day. They transport the wood to the district town during night as this is considered illegal. Poor farm households in Qararu sale firewood, charcoal and salty soil (*boolee*). As indicated in Table 5, menial works particularly sale of firewood and charcoal were exclusively carried out by poor households.

Migration to other Places: Households that reported that their members temporarily migrated to other areas in search of food constituted 19.9%. As indicated earlier most of these people migrate to their relatives in other areas who could be in a better condition than them. However, informants also indicated that some households have migrated to urban areas for begging. In fact, 7.5% of households have reported that they begged for food during rainy seasons of 2008.

Conclusion

In Ethiopia, the proportion of food insecure population is steadily increasing since the 1980s. More than 15% of the population was food insecure in 1985, 1992, 2000 and 2003 (Ministry of Agriculture and Rural Development, 2003). Geographically, it is expanding from traditionally food deficient areas to other parts of the country. One such area is Arsi Negelle district, where 84.2% of households have reported they have experienced food shortage in 2008. However, compared to Qararu and Raffu-hargissa *Kebeles*, Shopha-bultum was more

affluent, partly indicating the positive role of wet areas in agricultural production and food security.

The study identified drought, variable rain, rapid population growth and diminishing landholding size, high prices of crop output, absence of credit, poor work and saving tradition as impediments to households' food security in the district. Among these factors drought, variable rain and price escalation of consumer goods were identified as the main predicaments of food security. Institutional and structural factors (price) intertwined with environmental factors (e.g. drought, variability of rainfall) to exacerbate food insecurity in the area. These shocks (social and environmental) blurred the positive role of households' physical assets. However, farm households' perception of causes of food insecurity differs across agro-ecology/*Kebeles.*

When there is food shortage better-off households cope on their own through sale of small livestock, use of past cash savings and seeds. The poor rely on support of relatives, loan, rent out land and engage in menial activities. Even though it is not exclusive of the better off, the poor usually resort to choices that have far reaching consequences in their future livelihood. Unlike other strategies intentional loss of appetite was employed by both better off and poor households in much the same way. However, risk minimizing strategies were more accessible to better off households than others.

These require development actors to employ multiple approaches of interventions across *Kebles* and wealth status. However, particular attention should be paid to improving farm households' access to family planning services, improving extension services, encouraging farmers to engage in cash crop production, promoting off-farm and non-farm income sources, expanding rural market and accessing credit could play a paramount role in improving food security in the area.

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