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College of Development Studies

Household Food Security Situation in Girar Jarso Woreda, North Shewa Zone of Oromiya National Regional State, Ethiopia

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By: MESKEREM ABI

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Title

Household Food Security Situation in Girar Jarso Woreda, North Shewa Zone of Oromiya National Regional State, Ethiopia.

By
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Food Security

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Abstract

The central theme of this study was to explore household food security situation in Girar Jarso woreda. To do so, various data collection and analysis methods were used. The necessary data were generated both from primary and secondary sources to answer the research question. Hence, field observation, household survey, key informant interview and focus group discussions were the principal means of generating primary sources of data while secondary data were obtained from by reviewing various governmental and nongovernmental organization documents and reports, books and academic research papers. The collected data were coded and entered into computer software called statistical package for social sciences (SPSS) and analyzed by using various statistical techniques such as frequency, percentage, cross tabulation and Pearson chi-square test.

The Household Food Balance Model was utilized to quantify household food availability which indicated that the available dietary energy of households meet only 45.3 percent of the minimum daily allowance, 2100kcal. This shows a deficiency of 54.7 percent. To this effect, 84 percent of household faces food insecurity in which the causes are related to poor access to productive asset/resources. Moreover, respondent's expressed their perception on their household food security situation. As a result, 69 percent of households are perceived as they are food insecure while 85 percent perceived as they are non self sufficient.

Moreover, farmers perceived that the causes of household food insecurity are related to demographic, bio-physical, socio-cultural and infrastructural, economic, political and institutional factors. The study revealed that, high population pressure, land shortage, poor soil fertility, soil erosion, erratic rainfall distribution, poor saving, poor food rationing, inadequate veterinary services, low non farm income, insufficient farm holding, poor cash income, weak rural organization, poor extension services and use of modern farm input are considered by households as the main constraints of both the agricultural productivity and food security status of the households.

Food insecure household in the study area develops their own coping mechanism to household food shortage mostly by eating less preferred foods, reducing the number of meals, purchasing foods through selling small animals, grass, kubet and firewood

Based on the findings of the study, both short term and long term actions from government bodies, donors and households themselves to ensure household food security have been recommended.

Acronyms

ANPPCAN	The African Network for the Prevention of and Protection against Child Abuse and Neglect
CSA	Central Statistical Agency
EHNRI	Ethiopian Health and Nutrition Research Institute
FAD	Food Availability Decline
FAO	Food and Agriculture Organization
FDRE	Federal Democratic Republic of Ethiopia
FED	Food Entitlement Decline
FGD	Focus Group Discussion
FMD	Foot and Mouth Disease
GOs	Governmental Organizations
Kcal	kilocalorie
MRA	Minimum Recommended Allowance
NGOs	Non Governmental Organizations
PASDEP	A Plan for Accelerated and Sustainable Development to End Poverty
WAO	Woreda Agriculture Office
WDRMO	Woreda Disaster Risk Management Office
WFEDO	Woreda Finance and Economic Development Office

Glossary

Areqe	A local drink made from cereals through local distillation in the home by local people.
Belg	Small rainy season mostly from February to April
Debo/jigi	Labor sharing mechanism in which household mobilize large number of individuals to work on his/ her farm land mostly without reciprocation.
Dega	Agro-climatic zone that lies between 2400 and 3300 meter above sea level.
Humna	A mechanism of labor assistance/support to a household in need of labor.
Kebele	It is the smallest administrative unit in Ethiopia.
Kira	A system of casual wage labor arrangement in which individuals work for the better income sources.
Kolla	Agro-climatic zone that lies between 500 and 1500 meter above sea level.
Meher	Long rainy season based on summer rainfall
Qixira	A system of oxen use arrangement in which households who lack farm oxen rent in an ox or more to use its draught power.
Wenfel	Labor sharing mechanism among households on the basis of reciprocation with equivalent reciprocation with equivalent labor.
Woinadega	Agro-climatic zone that lies between 1500 and 2400 meter above sea level.
Woreda	Lower administrative unit in Ethiopia that is above the *kebele* and below zone.

The cause of failure of Sub-Saharan Africa to feed its alarmingly increasing population by and large is attributed to climatic problems like drought, resource degradation, inefficient policies, widespread epidemics, technology stagnation, continuous civil strife and conflicts, and the like (Degefa, 2005). Moreover, the type of food insecurity observed in Sub-Saharan Africa is a combination of widespread chronic food insecurity resulting from continuing poverty, transitory emergency-related food insecurity which occurs in periods of intensified pressure caused by natural disasters, economic collapse, or conflict (FAO, 2004). Many factors have also contributed to this tendency including the high prevalence of HIV/AIDS; an overall decline in farm input utilization including fertilizers, improved seeds, irrigation and the like.

Millions of people in the Horn of Africa are undernourished and at risk of famine due to recurrent drought, conflict, a weak infrastructure and a limited livelihood base; hence one of the most food-insecure regions in the world. In the region as a whole, more than 40 percent of people are undernourished, and in Eritrea and Somalia the proportion rises to 70 percent. Those suffering most from food insecurity are subsistence farmers, pastoralists and agro-pastoralists whose livelihoods largely depend on agriculture and animal production. They face food insecurity not simply because they do not produce enough food but because they usually have limited saving patterns and few other possible sources of income (FAO, 2010).

Ethiopia is characterized by extreme poverty, high population growth rate, severe environmental degradation and recurrent drought. So, as is true in most Sub-Saharan Africa, Ethiopia is currently facing challenging problems that are induced by environmental crises, demographic and socio-economic constraints, which adversely affect people's production system. This has resulted in agriculture being poor for several years to the extent that the country could not adequately feed its population from domestic production and prevailing both chronic and transitory food insecurity (Degefa, 2002). Furthermore, Ethiopia is the second largest country in Sub-Saharan Africa in which the majority of its population, about 84% (PASDEP, 2006; CSA, 2008) is engaged in rural and agricultural based economic activities. The main form of agricultural production in Ethiopia is an integrated crop-livestock or mixed farming system. It has the lowest per capita incomes in the world and high incidence of absolute poverty with some 40% (World Bank, 2007) of the population living below the poverty line. However, the agricultural sector

which employs more than 83% (CSA, 2008) of the country labor failed to feed its own population sufficiently and the country is not self sufficient in food production.

The main economic base of Girar Jarso *woreda* lies on a subsistence rain-fed agriculture, with high rainfall variability 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 role of irrigation is very limited due to scarcity of surface and ground water in the area, and agriculture is dependent on rain-fed farming for this matter.

1.2 Statement of the Problem

Although the level and intensity vary, food insecurity exists in many parts of developing countries such as Latin America, Middle East, South and South East Asia and African Countries (Degefa, 2005). Moreover, food insecurity situation in Ethiopia is one of the worst even as compared to sub-Saharan African standards. The causes of the food insecurity are environmental, economic, political, social, policy, and other related problems (Degefa, 2002). Similarly, Hussein (2006) in his study conducted in Wuchale-Jidda *woreda* classified the levels of the problem as degradation of bio-physical resources, poor socio-economic situation, poor policies and institutional setups. Furthermore, Hussein revealed that, poor soil fertility, land shortage, frost attack, water logging, chronic shortage of cash income, poor farming technologies, weak extension services, high labor wastage, and poor social and infrastructural situation have caused the problem of food insecurity. Hence, a combination of factors has resulted in serious and growing problem of food insecurity in Ethiopia.

This research study is conducted in the three rural *kebeles* of Girar Jarso *woreda* namely Torban Ashe, Girar Geber and Wodesso Amba. The main economic stay of the population in Girar Jarso *woreda* is mixed farming system at subsistence level, producing both crop and livestock. Agro-ecologically, the *woreda* is classified into three major altitudes: *dega, woina dega* and *kolla*. The difference in agro-ecology causes variation in natural resource endowments, topography and weather pattern of the area, the type of crop grown and purpose or importance attached to the

crop grown and productivity of production to vary. Furthermore, heterogeneity in altitudinal zone causes the area to follow different livelihood strategies and make use of various coping mechanism at the time of food shortage. This, in turn, influences the household food security situation in the study area. The *woreda* has low agricultural production and productivity due to various interrelated problems such as decline in crop and livestock production, degradation of natural resources, and existence of poor social services in the area which adversely affect food production. The low level of agricultural production and productivity existed in the area results in the existence of seasonal food shortage and vulnerability of the households to food insecurity particularly in lowland (*kolla*) portion of the study area (ANPPCAN, 2009). Moreover, the livelihood means of *kolla* area are often prone to crises as compared to *dega* and *woina dega* areas due to its multiple ecological, economic and infrastructural problems. Hence, considerable members of people depend on relief food during crises.

According to data obtained from *Woreda* Agriculture Office, the current crop production and productivity in the *woreda* are found in a declining trend because of various production constraints including poor soil fertility, high crop losses due to insect pest (such as aphids, cutworm, African boll-warm, stalk borer, army worm, sorghum chaffer) and diseases (such as rust), and low level of input utilization. Livestock production is also another important source of livelihoods in the study area. However, due to various production constraints such as shortage of animal feeds, prevalence of livestock disease and poor veterinary services, potential benefit obtained from livestock production is limited (WAO,2010). On the other hand, expansion of farmland for crop production, decreased grazing land and results in shortage of animal feeds (ANPPCAN, 2009). Therefore, shortage of animal feed causes productivity of livestock production to decline. This brought low income earning and limits the purchasing capacity of the household to have access to food. Hence, the prevalence of food shortage of the household is high or even increased in the prevailing of livestock feed shortage. On the other hand, poor asset position of the household causes household food insecurity. Thus, the intention of this paper was to investigate the situation of household food security in Girar Jarso *woreda*.

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1.3 Objectives of the Study

The general objective of the study is to explore the level of household food security, its determinants and coping strategies that the food insecure households rely on in Girar Jarso *woreda.*

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1.3.1 Specific Objectives

- To describe the situation of food security and examine the extent to which households could access enough food throughout the year in the study area.
- To investigate the major economic, bio-physical, socio-cultural and policy related factors that inhibits households from producing enough food for their families.
- To examine the major coping strategies used by the farmers during food crises.

1.3.2 Research Questions

- What is the level of food security situation at household level and to what extent do the household access enough food throughout the year?
- What are the major factors that contribute household to food insecurity?
- What are the coping strategies used by the households during the time of food crises?

1.4 Significance of the Study

Basically, the research study is undertaken for academic purpose. It is limited to a single *woreda* and done at the household level. Despite its limited area coverage, the result of the findings of the study are believed to add some insight related to household food security at national /country/ level in general, and household level in particular. Achieving household food security has been one of the priority agendas of the Ethiopian government. Hence, the finding of the study can contribute to create awareness on food security situation at grass root level and provide additional information and understanding to local conditions through providing some awareness related to household food security in the study area. The study would also benefit other researchers and organizations who may intend to conduct further study on related issues.

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1.5 Limitations of the Study

The researcher encountered a number of problems during data collection period. One of the main problems was inaccessibility to contact enumerators. This makes the data collection period longer than planned for.

The number of respondent households included in the sample survey was relatively small to represent the total population of the studied household of the *woreda* in general and target *kebele* in particular. Hence, from the total population of 2649 households in the selected *kebeles*, 100 households were selected for the study, which is about 3.8% of the total households in the selected *kebeles*. In fact, the selected sample size may not represent; but, given time and resource constraint it was difficult to select the representative sample size.

In addition, lack of willingness of some of the sampled households to provide real information about their asset possessions, and production level brings some limitation to the finding.

1.6 Organizations of the Thesis

This research thesis contains seven chapters. The first chapter introduces the background, the statement of the problem, objectives, justification, significance and limitations of the study. The second chapter covers review of related literature that is related to the subject matter. The third chapter is about methodology, which consists of description of study area, sample design, sampling techniques, data collection and data analysis methods. Analysis and discussion parts of the study are found in chapter four, five and six. In chapter four, access to productive resources of the study area are analyzed and discussed. Household income, expenditure and consumption of sampled households including availability of food grains and energy of household is considered in chapter five. Similarly, food security and household coping strategies to food shortage is described in chapter six. Chapter seven summarizes the major findings, concludes the work and suggests recommendations.

Chapter 2 : Review of Theoretical and Related Literature

2.1 Conceptual and Theoretical Frameworks

2.1.1 Conceptual Frameworks

The conceptual framework of food security has progressively developed and expanded particularly on the basis of the growing incidence of hunger, famine, and malnutrition in developing countries (Debebe, 1995). The concept of food security is broad, diversified, and dynamic. The rationale behind this is the varied geographical, social and economic set up of the world communities that tend to understand the concept differently (Hussein, 2006).

The history of food security definitions shows that, the focus has moved from global and national perspective to household and individual level (Maxwell, 1996). In the mid 1970s, food security was conceived as adequate food supply at global and national level though significant proportion of the population has suffered from hunger and malnutrition (Debebe, 1995). However, mere availability of food at the global level does not guarantee acquisition of food at the household and individual level (Getachew, 1995) and hunger could persist with the presence of adequate food supply at the national and international level (Maxwell, 1996).

In the early 1980s, the concept of food security attained wider attention and the unit of analysis shifted from national and global level to household and individual level. The most widely used definitions of food security is the one forwarded by World Food Summit in 1996 which define as: "Food security exists when 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 healthy life" (FAO, 1996). This definition integrates access, availability, utilization and stability of food. Hence, the current definition of food security recognizes the complex inter-linkages between the individual, households, community, nation and international economy (Maxwell, 1996).

Having similar basic concepts, different institutions and organizations defined food security differently. Conventionally, food security is defined as: "access by all people at all times to enough food for active and healthy life" (World Bank, 1986:1). This definition is generally

accepted as it encompass both food availability (adequate supply of food) and food access through home production, purchase in the market, or transfer (Degefa, 2002) and also stresses on individual access at all times to enough food not just for survival, but for active participation in a society (Maxwell, 1996).

Moreover, Getachew (1995) define food security in the context of subsistence farmers as "ability to establish access to production resources such as land, livestock, agricultural inputs and family labor combined to produce food or cash" (Getachew 1995:29). Hence, food security analyzed at the household level is determined by a households own production and members' ability to purchase food of the right quality. With regard to this definition, Bonnard (1999) cited in Degefa (2002) argued that, with respect to the three components of food security, agriculture constitutes the most important factor in food availability, a primary factor in food access and a complementary factor for food utilization where livelihoods are agriculture-based.

Food insecurity is the situation of not having enough food for all people at all times (Degefa, 2002) and occurred in a situation where available food is not accessible due to erosion of peoples entitlement to food (Frankenberger,1992). Food insecurity can be classified as chronic or transitory depending on the intensity of the problem, duration and strategies used to withstand the problem. Chronic food insecurity is persistent lack of household's ability either to buy or produce enough food due to lack of access to resources (Maxwell and Frankenberger, 1992) and manifests itself in the form of market failure due to recurrent drought and other calamities (Debebe, 1995).The structural factors contributing household to chronic food insecurity are fragile natural resource bases, weak institutions and inconsistent government policies (FAO, 2002). Transitory food insecurity is temporarily decline in a household's access to enough food resulting from instability in food production due to crop failure, seasonal scarcities, temporary illness or combination of all these factors (Degefa, 2002), food prices and household income (Maxwell and Frankenberger, 1992).

2.2 Theoretical Framework

The objective of this study is to explore the major factors that constrain household food production to increase food availability thereby result in sufficient (enough) food available at household level. Therefore, to examine household food security situation and how failure of

agricultural production results in household food shortage, various theoretical frameworks that are related to household food security are employed. A clear understanding of the theory of food security is an essential element to better understand household food security situation. Hussein (2006) revealed that, it is impossible to select one theory to use for the whole study as all of these theories are not free of weaknesses. Thus, various theories were used in a way they complement each other to understand the household food security situation. The major theories considered in this study includes: general explanation of food insecurity, models of food insecurity and sustainable livelihood approach. Livelihood approach (SLF) was utilized to analyze this study.

2.2.1 General Explanation of Food Insecurity

The general explanation theory mainly emphasize on the impacts of drought, flood, land degradation, inaccessibility to productive resources and population pressure on the performance of household food security situation. Hence, results in disruption of agricultural production and attributes the household to decline in food availability. Demographic and climatic theories are considered in this study.

2.2.1.1 Demographic Theories

The central concern of demographic theory is the relationship between population growth and food availability in which two divergent and competing theories exist regarding their relationship. The first theory is the Malthusian perspective which aims that uncontrolled rapid population growth is the cause of food shortage and argues that, unless population growth is checked, food production cannot keep pace with it. However, Malthus theory faces critiques from different scholars as the theory fails to allow for means of improving household food security (Degefa, 2005). The second theory regards large population growth as a positive stimulant for economic and social development in which the works of Easter Boserup is remarkable. Boserup (1965) sees population growth as a force, favoring an adoption and diffusion of technological innovation that expands agricultural production, thereby reducing vulnerability to food insecurity and hunger. She argues that the positive effect of population growth is by making financially feasible investment in infrastructures such as irrigation, energy, transport and improved production technologies (Degefa, 2005). To sum up, the two theories are the most competing theories in the analysis of population growth and food production.

levels to include an assessment of peoples' strategies, assets and capabilities (Devereux, et al, 2004). Key features of livelihood approach include livelihood asset/capital, context, mediated process, activities and livelihood strategies, and livelihood outcomes. Hence, the livelihood conditions of the household to be food secure or not, largely depend on the interaction between livelihood resources (asset), the existing context situation (trends and shocks), the mediating process (institutions, organizations and social relation), and the resulting livelihood strategies that a household pursues (Scoones, 1997; Ellis, 2000; Degefa, 2005).

Livelihood asset or capital: the ability to pursue different livelihood strategies in general and household food security in particular depends on the asset people possess (Degefa, 2005). Livelihood assets/capitals are grouped under five types of capital; natural, physical, human, social, and financial capital.

i. **Natural capital** refers to land, water and biological resources that are utilized by people to generate their means of survival (Ellis, 2000). These resources play a vital role in rural areas in general whose livelihood is totally or partially dependent up on the natural resource base.
ii. **Physical capital** refers to the basic infrastructure such as transport, shelter, and irrigation works as well as production equipment which enable people to pursue their livelihoods (Scoones, 1998). It involves household level property ownership such as production equipment, livestock ownership, and other asset possession and community infrastructure
iii. **Human capital** refers to the labor available to the household and other qualities embedded in it such as education, skill, knowledge, good health and physical capability that are vital to pursue various livelihood strategies in general and to achieve household food security in particular (Degefa, 2005).
iv. **Social capital** refers to social resources involving networks, social claims, associations and social relationships up on which people draw in pursuit of livelihoods (Degefa, 2005).
v. **Financial capital** refers to the financial resources available to people through saving, supplies of credit, regular remittances or pension and which provide them with different livelihood options either from formal or informal sources. (Carney, 1998).

Context (trends and shock): refers to the external environment in which people exist and negatively affect people's livelihood asset (Devereux, 2001). Livelihood activities pursued are influenced by shocks such as recurrent drought, water logging, flooding, human health, pest damage to crop and livestock diseases and trends such as rapid population growth, deforestation, shrinking size of per capita landholdings, decline in soil fertility and decline in production that are operating in varying degrees exogenous to household and to local circumstances.

Mediating process (institutions, organizations and social relations): Most of the time access to livelihood resources requires mediated process such as institutions, organization and social relations (Degefa, 2005). The most commonly known institution in the study area are laws and sharecropping arrangement while social relation include community elders, religious leaders and gender. Furthermore, organizations create suitable condition for the community and determine access to livelihood resources. This includes government organization, NGOs and Farmer Service Cooperatives/ Association at different level.

Activities and livelihood strategies: Livelihood strategies consist of activities that generate the means of household survival (Ellis, 2000). However, the ability to pursue various livelihood strategy is depends on the basic asset/resources that households have possess (Scoones, 1998).

Livelihood out comes: livelihood outcome is the end result of the interaction of various elements in a system that can be desirable/undesirable or food secure or insecure outcome. According to Degefa (2005), the desirable outcome underlines the livelihoods of negligible proportion of relatively well off households, who have been in a position to accumulate asset over several years and attain food security on a sustainable basis while undesirable outcomes underlines for the rest members of the communities, who have survive under vulnerable livelihood situations and food insecurity rise up on them frequently.

2.3 Review of Related Works on Household Food Security

2.3.1 Determinants of Household Food Security

Household food security situation is determined by availability and access to food. A number of interrelated factors determining food security situation of households, individuals and community varies from immediate factors that affect food supply or the overall economic system of the

country (Debebe, 1995). Furthermore, Debebe realized, that sufficiency determine food security situation of a household as it indicates enough supply of calorie including necessary intake of proteins and micronutrients. Food availability is determined by availability to productive resources such as cash income, labor, land, production equipment while food access is determined by purchasing power of households, efficiency of market, infrastructural facilities and social support. Hence, efficient allocation and utilization of resources determine households' food supplies and access to resource plays a key role to promote food security or increase vulnerability to food insecurity (Debebe, 1995).

2.3.2 Review of Literature on Food Security Situation in Ethiopia

In this sub section, the food security/insecurity situation in Ethiopia is discussed by putting more emphasis on the local context/problems. As stated in Dessalegn (1991) cited in Mesay (2008), the history of Ethiopia is highly linked with severe recurring food shortages and famine. Adverse climate changes combined with high population pressure, environmental degradation, technological and institutional factors have led to a decline in the size of per capita landholding causes a serious growing of food security problem in Ethiopia (PASDEP, 2005). Ethiopia and most sub-Saharan Africa nations have experiencing a decline in per capita income and food production which have led to food insecurity (Sisay, 1995). Getachew (1995) relates the problem of food insecurity in Ethiopia with recurrent drought and long term secular decline in resource endowment. Similarly, FDRE (2002) indicates that, the cause of food insecurity in Ethiopia related with man-made and unusual shocks, such as drought and lack of productive assets. Currently, there is growing consensus that the food insecurity and poverty problems are closely related in the Ethiopia situation. Ethiopia is listed among those countries in Sub-Saharan Africa with the most perilous long term food situations. Various historical records revealed that, Ethiopia has faced some 44 severe famine catastrophes with a series of rain failures and substantial livestock loss. About 8 million Ethiopians were affected, and 1 million were estimated to have died (Webb and von Braun, 1994; Degefa, 2005).

According to Devereux (1993), the term famine is used to explain severe food insecurity and it is referred as the worst manifestation of food insecurity. Sen (1981) argues that, famine prevails when people lack the ability to command affect a subsistence production system. On the other hand, Degefa (2002) in his study conducted in Oromiya zone indicates that, though the causes of

household food insecurity vary from household to household, the major causes of food insecurity in Ethiopia are closely related to environmental, demographic, economic, social, infrastructural and political factors. Similarly, Hussein (2006) categorizes the causes of food insecurity as bio-physical, socio-economic and political constraints. Generally speaking, the main causes of food insecurity are environmental, demographic, economic, social, infrastructural, and political dimension in their nature.

Environmental Factors

Environmental factors include land, water, vegetation, soil and climate up on which agricultural activities such as crop, livestock rearing that enable food production and generate income to purchases food are based (Hussein, 2006). Hence, any negative impact on these activities put agricultural activities under question and adversely affects food security situation of the household. The degree of environmental influence varies depending on the level of development. Regarding this, subsistence farmers are more susceptible to environmental shocks and consider natural resource degradation as the causes of food insecurity in Ethiopia (Degefa, 2005). The basis for his argument is the subsistence peasants dominated by rain-fed type of agriculture that is pursued despite the large percentage of agricultural population that the country supports.

Moreover, Getachew (1995) in explaining the effect of environmental changes on the livelihood of farmers in Ethiopia argue that, the traditional farming systems of the Ethiopia peasants consume and exploit the natural resource base. Therefore, environmental factors related problems such as drought, land shortage and fragmentation, excessive water, resource degradation and depletion of natural resources are inevitable and become a threat to agricultural production in general and food production in particular.

Demographic Factors

Rapid population growth has leads to a demand for additional land and clearing of forests for expansion of farmland and settlement. The Ethiopian Food Security Strategy of 1996 stipulated that, high population growth rate is one of the main impediments to ensure food security, provide effective education; health and other basic social and economic service (FDRE, 1996). On the other hand, Degefa (2002) in his study of seasonal food insecurity in Oromiya zone, revealed that

the rate of population growth which exceeds the rate of economic growth has results in diminishing of landholding size for farmers and constrained them to produce sufficient food grains, resource utilization and limited fallow period among the rural communities.

The study conducted by Hussein (2006) in Wuchale-Jidda *woreda* re vealed that, the major problems associated with demographic factors are high population growth, land fragmentation, over grazing, poor fallowing practice, diminution of landholdings and high age dependency. Hence, demographic factors are expressed as the root causes of environmental degradation and declining land productivity which, in turn, leads to low food production from agriculture and thereby incurs food insecurity.

Economic Factors

According to Degefa (2002), some of the economic problems that are considered as constraints to agricultural production in general and food security in particular are lack of cash income, poor off farm income ventures, diminishing of farm holding, shortage of draught power, low modern farm input, traditional farm implements and practices. Among these problems, lack of cash income manifests itself not only in the livelihood of the farmers but also directly on agriculture then food security. In additions farmers with no ox are more vulnerable to households' food shortage as they cannot properly and timely prepares their farmlands. Hence they rent out their land to other farmers with better draught power or have to get oxen on rent which makes them loose of some of their produce through shares.

Study conducted by Yared (2001) in understanding the effect of economic factors in households food production revealed that, agricultural inputs such as improved seeds, fertilizer, herbicides, and farm implements which are vital to increase production and productivity are not well accessed by most farmers due to high cost of chemical fertilizer and improved seeds, poor performance of the market, and the like (Yared, 2001 cited in Mesay, 2008). Therefore household economy related problems are directly constrain households to improve agricultural production in general and food production in particular.

Social Factors

According to Degefa (2002), social factors such as shortage of human labor, health problems, low levels of education, poor food rationing and absence of saving traditions are among the causes of the occurrence of seasonal food shortage in farm households. In addition to this, the socio cultural events such as eating habit and food preferences, social ceremonies and festivals would also influence the food security status of the households and way of saving or expenditures which directly or indirectly affects the food security situation of the households. Hence, contribute for persistence of food insecurity in the household.

Infrastructural Factors

Many literatures indicated that, inadequate infrastructures and social service development such as road, transportation, communication, electrification, education and health services, and agricultural extension services would be the major challenges to sustain the growth of agricultural production and thereby ensure households food security. Thus, infrastructural constraints such as inaccessibility to roads, absence of irrigation facilities, absence of rural credit, inadequate extension services, poor storage facilities, low price of agricultural output, and inadequate veterinary services are reflected on household's food insecurity (Degefa, 2002).

Households diversify their source of income by engaging in off farm and nonfarm activities. Thus, households need credit facilities as the most infrastructural factors. Basically, the sources are expected to be either from formal or informal institutions such as NGOs, Governments, Microfinance Institutions, private money lenders, traders, and the like (Mesay, 2008). However, Degefa (2005) indicated that, obtaining loans from local money lenders has largely declined due to the inability of poor households to repay loans. This has led to mistrust among them and become a major problem to obtain loan.

Political Factors

Currently, many researchers argue that, the causes of food insecurity go beyond degradation of physical resources and poor socio-economic situations of respective countries; rather they relate the underlying causes of food insecurity to policy and institutional issues (Getachew, 1995; Sisay, 1995; Degefa, 2005).

Among these researchers, Degefa (2005) strongly argue that, even though natural catastrophes such as drought and flood cause crop production failure, the main reasons for the persistence of food insecurity is due to governments' policy failure. Accordingly, Degefa identified two major government policies that can lead to food insecurity: absence of better shock absorbing capacity during times of natural hazards, and weakness in intervening through emergency at times of food shortage and starvation.

2.4 Household Coping Mechanisms

During food shortage, households adopt various behavioral and material responses to cope up with adverse situations to minimize the subsequent losses that could occur (Alem, 1999; Yared, 2001 cited in Hussein, 2006). Household responses involve trade-off between and within various coping options. In other words, different households with in a community stand at different points along the continuum and their response to threat various depending on their resource endowment, access to community support and access to public intervention (Webb and Von Braun, 1994).

Maxwell (1996) classified household responses to food insecurity into two: coping strategies and adaptive strategies. Coping strategies are responses made by households to improve the declining situation of households food security while adaptive strategies involve, a permanent change in the mix of ways in which food is required, irrespective of the year in question and it refer to long-term adjustment. The most commonly practiced coping strategies during abnormal season include short term dietary change, changing intra household food distribution like skipping adults to feed children, limiting size and frequency of food, borrowing and gifts from relative and friends, mutual support mechanism, selling of livestock and fire wood, cash for work and relief assistance, etc. while the commonly used adaptive strategies include risk minimization, food and income diversification mechanism, planting damage resistance crop, cultivating marginal soils, etc. (Maxwell,1996; Degefa, 2005).

2.5 Analytical Framework

Conceptually, food security is defined as access by all people at all times to enough food for an active and healthy life which comprises food availability and food access through home production, purchase in the market or transfer. As it is repeatedly mentioned, food security at the

household level is conditioned by a household own production and household members ability to purchase food of the right quality in the market place. Hence, it encompasses food access, availability and utilization.

Food availability addresses the household adequate supply of food and is determined by the level of home production, purchase in the market or food transfer. Food availability can be affected by disruptions of food production due to bio-physical related problems, poor access to productive resources and rapid population growth.

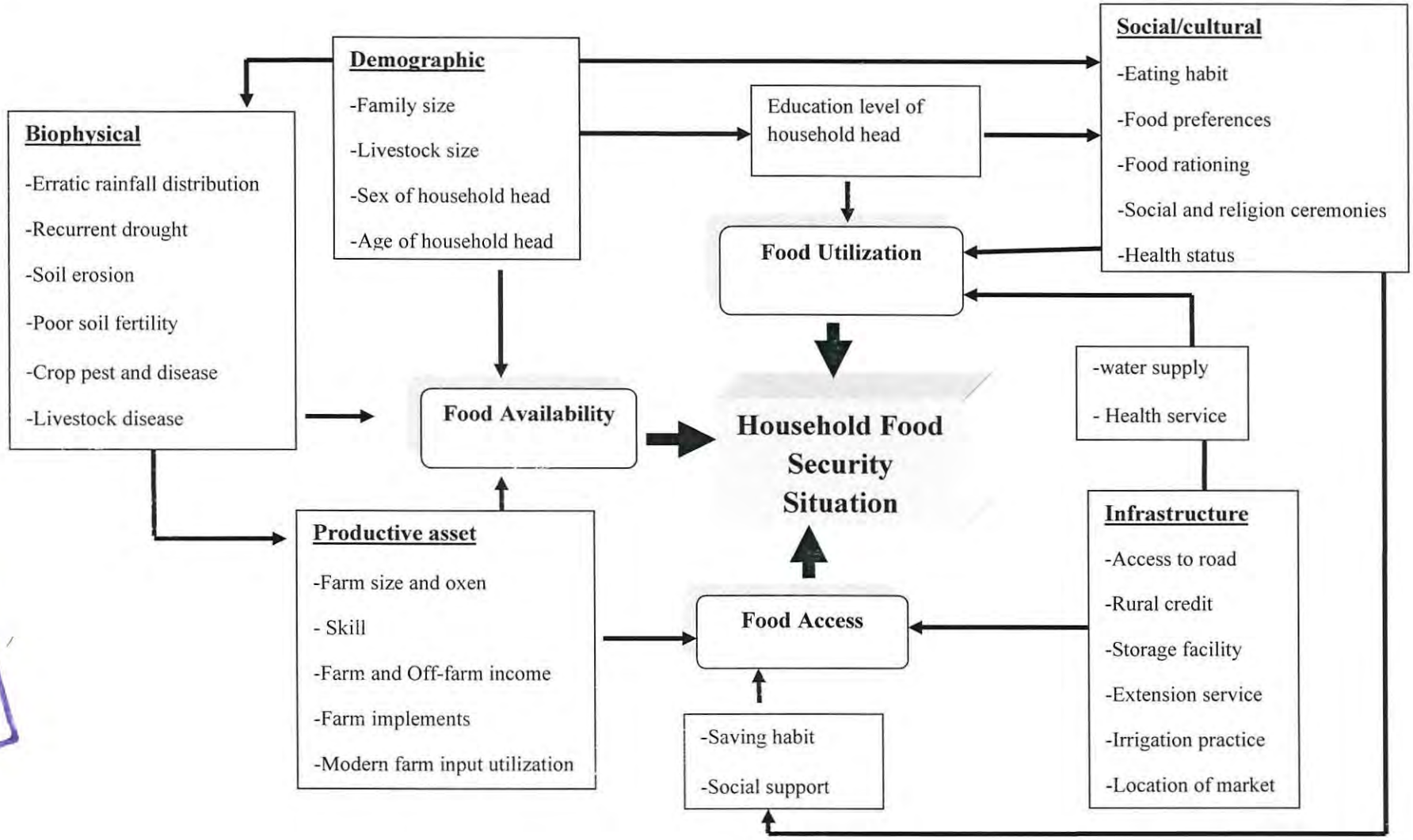
Food access refers to the way in which households acquire available food in different means. This include home production, purchase in the market, borrowing, gifts from relatives/friends, and provisions through relief systems or food aid. Access to food is depends on household's sources of income ventures and saving pattern, social capitals, access to road, and markets.

Food utilization is the way in which people utilized food. It is determined by a number of interrelated factors including eating habit, food preferences, the quality of the food and its method of preparation, food rationing, water supply, and the nutritional knowledge and health status of the household.

Generally, the analytical framework of this study as shown in Figure 2.1 incorporates five variables adversely affecting household food availability, access and utilization, which in turn determine the household's food security situation. These are demographic, bio-physical, productive asset/resources, infrastructural and socio-cultural factors.

a) Demographic Factor: comprise family size, livestock size, sex of household head, age of household head and education level of household head.
b) Bio-physical Factor: include erratic rainfall distribution, recurrent drought, soil erosion, poor soil fertility, crop pest and disease, and livestock disease.
c) Productive asset/resource: consist of farm size, farm oxen, skill (knowledge), remittance, farm implements, and farm and off-farm income ventures.
d) Infrastructural Factor: involve access to road, rural credit, storage facility, extension services, irrigation practice, access to market, water supply, and health services.
e) Socio-Cultural Factor: encompass eating habit, food preferences, food rationing, social and religious ceremonies, health status, saving habit and social support.

Figure 2. 1 Analytical Framework



Source: Researcher own construction, 2011

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Chapter 3 : Research Methodology

3.1 Description of the Study Area

Girar Jarso *woreda* is one of the thirteen *woredas* of North Shewa Zone, Oromiya National Regional State. The *woreda* lies along the highway to Amhara National Regional State in the Northwestern direction at a distance of 112 km from Addis Ababa. It shares border with Amhara Region in the North, Yaya Gullalle *woreda* in the East, Debre Libanos *woreda* in the South and Degem *woreda* in the West. The total area of the *woreda* is about 42763 hectare. The altitude of the *woreda* ranges from 1300 to 3419 meters above sea level. Astronomically the *woreda* occupies $9^0$35'-$10^0$00'N latitude and $38^0$39'-$38^0$39'E longitude. According to Fiche Station meteorological data the average rainfall amount of the *woreda* is about 1200mm, and maximum and minimum rainfall is about 1115mm and 651mm, respectively. Temperature of the *woreda* ranges from a minimum of 11.5^0c to a maximum of 35^0c (*WFEDO*, 2010).

Depending on the census results of 2008 the total population of the *woreda* is 67298. The number of female and male population is 32836 and 34462, respectively giving sex ratio of 100 female to 105 male. The average population density of the *woreda* is 157 persons per km^2 (CSA, 2008). Girar Jarso *woreda* consists of people with few ethnic groups, Oromo and Amhara. The majority of the people in the area belongs to Oromo ethnic group and speaks Afan Oromo while the rest belongs to the Amhara ethnic group and speaks Amharic (WFEDO, 2010). According to data obtained, 75 percent of the household are belongs to Oromo ethnic group while 25 percent belongs to Amhara. Commonly, people living in *dega* and *woina dega* areas speak Afan Oromo while Amharic is spoken by people living in *kolla* areas. With regard to religion, almost all of the populations of the *woreda* are followers of orthodox Christianity. But, the majority of the people in the study area practiced various traditional religion such as *atete/facafanna, irressa, borenticha* and *wadaja* along with Orthodox Christianity.

According to WAO (2010), the land feature is characterized by flat land, mountains, sloppy to steep sloppy and gorges. About 36 percent of the land area is flat while the proportion of the total area that is considered as sloppy is about 33 percent. The remaining 31 percent is classified as mountainous and gorges. Agro-ecologically, the *woreda* is categorized into three: *Dega, Woina-*

Dega and *Kolla* constituting 52%, 41% and 7% of the total area of the *woreda* respectively. The types of soil in the study area are Vertisols 38%, Nitosols 38%, Cambisols 11%, and other type of soil is 13%.

With regard to land use pattern, the researcher observed from basic data of *woreda* agriculture that cultivated land covers the largest share, 71 percent while grazing land is the second largest land use pattern that covers 11 percent. About 8 percent of the *woredas'* land area is unusable land which is neither cultivated nor grazed this includes, rugged topography, mountainous and exhausted degraded land areas. The remaining proportions include forest areas and settlement areas i.e. built up and leased out land for investors like dairy farm and poultry farm around Kotichoo Safani and Warxu *kebele*, cover 4 and 6 percent, respectively. In the study site, all farmland owned by individual household was cultivated land, grazing land and forest areas. Data obtained from survey result shows that, no farmland is fallowed due to shortage of cultivated land hence the households put all land under cultivation. According to the informants in Weddesso Amba *kebele*, fallowing land for a minimum of a year is common in *kolla* areas before a decade. But currently due to shortage of farmland no one is fallowing his/her farmland though the productivity of farmland is declined.

Farming is the main livelihood strategy of the study area in which seasonal rainfall pattern determined the production activity. More than 90 percent of the population depends on subsistence farming as the livelihood strategy. In Girar Jarso *woreda, belg* crop production accounts 14% while *meher* crop production accounts about 86%. Hence, *meher* crop production is the major livelihood strategy that people engaged in (WAO, 2010).

The major crops grown in Girar Jarso *woreda* include cereals, pulses and horticultural crops such as fruit, vegetables, root crops and beverages. Cereals include teff (Eragrostis tef), wheat, barley, maize and sorghum whereas; pulses include bean, peas, field pea, lentils and vetch. Besides, in a very small amount oilseeds such as linseeds and *nug* (*Guizotia abyssinica*) are growing. *teff*, wheat, barley and oats are important crops grown in *dega* and *woina dega* areas while sorghum, *teff* and maize are grown in *kolla* areas. Pulses such as bean, peas, field pea, vetch, and lentil are dominantly grown in *dega* and *woina dega* areas.

Depending on Post-Harvest Assessment of WAO (2010) report, the total land cultivated in 2010 crop year, was 30400 hectares and a total of 638,921 quintals of different crop were harvested. Of this, cereals make up 75 percent of total production followed by pulses that covers 24 percent of the total production. Oil seeds constituted the remaining 1 percent. On individual crop production basis, wheat constituted the largest proportion of cereals, 28 percent followed by *teff* 20 percent and barley 19 percent.

Apart from crop production, livestock rearing is also another livelihood activity in which households engaged as a source of food, cash income and draft power in the study area. The total livestock population is estimated as 119650 cattle, 33250 sheep, 17295 goat, 2290 horses, 380 mules, 14650 donkey, 72270 chicken and 1915 bee hives. Furthermore, data obtained from *WAO* shows that, among the total households heads, 22.3 percent of farmers do not have farm oxen, 29.6 percent have own one ox (single ox), 37.3 percent own two (pair) oxen, 7.3 percent have own three oxen and only 3.5 percent of household head possess more than three oxen. The average number of farm oxen per household is 1.5 (WAO, 2010).

The main source of income of the study area is obtained from sale of livestock and livestock products (such as milk, cheese and butter), livestock by-products (such as *kubet*), crops, firewood and eucalyptus trees for *dega* and *woina dega* areas. In *kolla* areas the dominant sources of cash income are obtained from sale of fruits, vegetables, beverages, cereal crops especially *teff*, crafts and the like. Besides, Non-farm activities such as petty trade, handicrafts, casual wage labor, and the like are the main sources of income in the study area. However, income obtained from nonfarm activities is limited as compared to farm activities.

The livelihood means of *kolla kebeles* are prone to crises as compared to *dega* and *woina dega kebeles*. As the researcher observed the topography of the area such as mountainous, sloppy and gorges are the causes of natural disaster such as landslide, flood and recurrent drought which, in turn, would leads crop failure and threaten human and livestock life. Thus, given poor vegetation cover in *kolla* areas, both excess and scarcity of rainfall causes the problem of food insecurity.

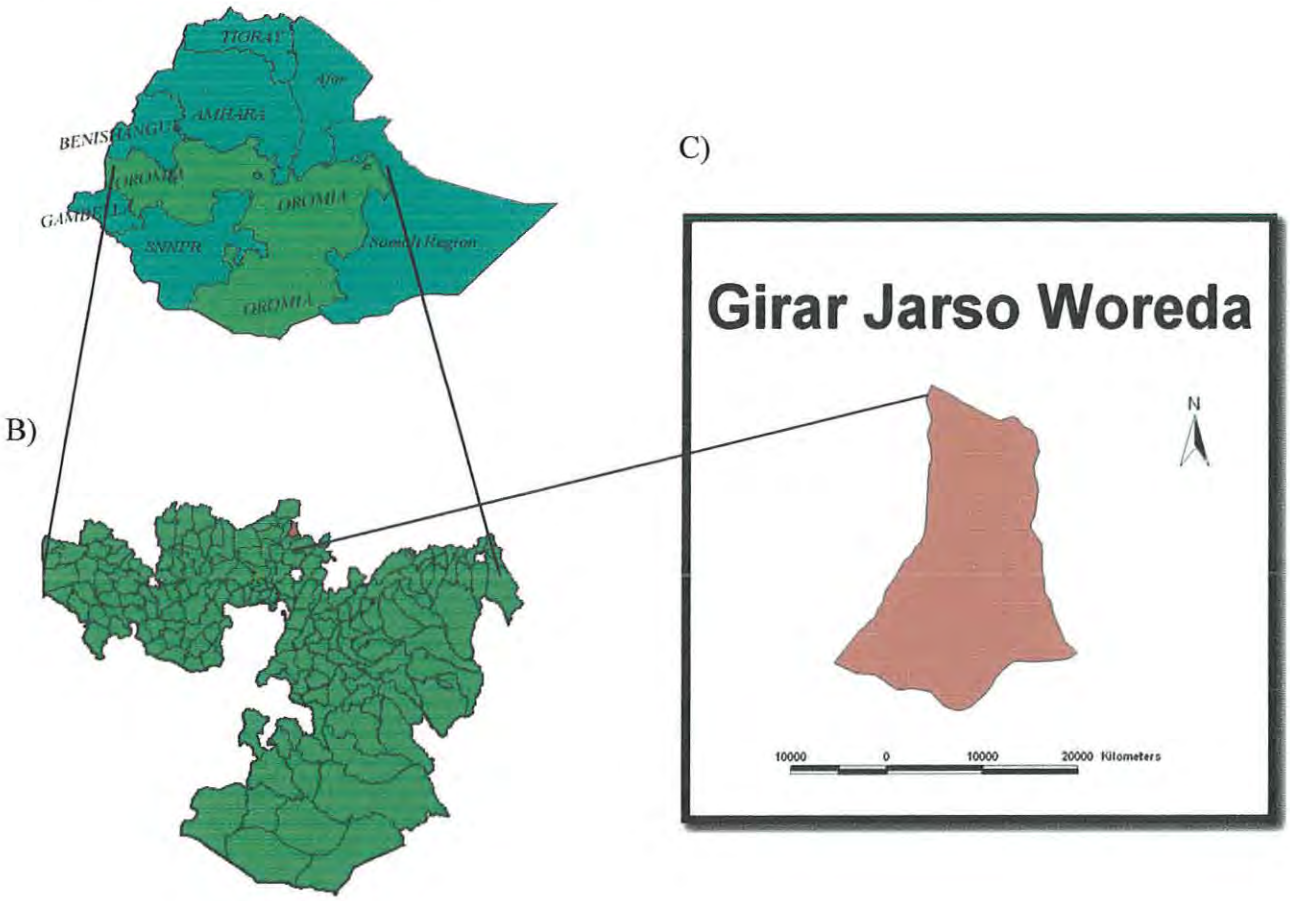
The discussion made with the head of *Woreda* Disaster Risk Management Office shows that, five *kolla kebeles*, namely, Silmi, Addisge, Shabal Faaxii, Weddesso Amba, and Sherer Genet *kebeles* are considered as chronically food insecure. As a result, people of the area depend on

food aid during crises. Data obtained from *woreda* disaster risk management office shows that receiving food aid/relief starts among 1993 (WDRMO, 2010).

Girar Jarso *woreda* has poorly developed basic social service such as transport, communication, electric power, water supply and health services (WFEDO, 2010). Lack of water sources to access irrigation services causes the *woreda* to depend on rain-fed agriculture. This cause low agricultural production and productivity to produce that would enhance food insecurity in the *woreda*.

Figure 3 1 Map of the study area

A)



Note: A) Map of Ethiopia, B) Map of Oromiya Region, C) Map of Girar Jarso Woreda

Source: Geographical Information System, 1992

3.2 Sample Design

The sample size of this study was determined or calculated using the following formulas of sample size determination which was adopted from Singh (2007). The formula was given as,

$$n = p(1-p)/SE^2$$

Where, n- Sample size

P-estimated proportion of respondent household to be food secure

SE- marginal error (sampling error)

As the proportion of respondent household to be food secure were not known, it was assumed that 50% of respondent household are food secure and the rest food insecure. Hence, 0.5 was used as p-value to obtain the sample size (n). Similarly, the marginal error (SE) of this study was 5%, which is equal to 0.05. The sample size of this study was therefore determined as:

$$n = p(1-p)/SE^2$$

$$= 0.5(1-0.5)/(0.05)^2$$

$$= \underline{\mathbf{100\ households}}$$

3.3 Sampling Technique

The sampling frame for this particular study was rural households that are found in three agro-ecological zone of Girar Jarso *woreda*. The study area, is selected purposefully and carefully so as to represent the *woreda* in terms of economic, socio-cultural, and physical factors like agro-ecology, accessibility to infrastructural facilities, natural resource endowment, and the like. For some of these factors, the study area was selected. Mainly, the familiarity of the researcher with the study area causes to select purposively.

Moreover, multi- stage sampling technique was used to select the representative samples. At the first stage, rural *kebeles* were stratified by agro-ecology (*dega, woina dega, and kolla*) and then three rural *kebele (*Girar Geber, Torban Ashe and Weddesso Amba respectively) were selected randomly, i.e. one *kebele* from each agro-ecological zone.

At the second stage, one *gott* from each *kebeles (*Annaso-Sago from Girar Geber, Shebel- Botori from Torban Ashe, and Feres-Amba from Weddesso Amba*)* were selected by using purposive sampling technique in consultation with the *kebele* Development Agent and *kebele*

administrators. Purposive sampling technique was employed to select the study site depending on the intensity of vulnerability of areas to seasonal food shortage, and inaccessibility of the areas to social services that prevails the household to food insecurity. Besides, representativeness and accessibility of getting data from respondents were the major factors to select the study site purposively. Hence, it is appropriate techniques to have a deep understanding of the household food security situation of the study area.

At stage three, respondent households were selected by using stratified random sampling technique. Respondent households were stratified as male-headed and female-headed. The purpose of this stratification was to explore household food security situation of different groups and to understand the most affected segment in the study area. Since *kebeles* differ in terms of the total number of households they encompass, proportionate stratified sampling technique was employed to identify number of households from each agro-ecology, *kebeles,* and *gott.* For household survey, 100 sample households (60 male-headed and 40 female-headed households) were selected randomly from *kebele* Administration registration book (Table 3.1).

Table 3.1 Distribution of Sample Household by Agro-ecology

Sample *Kebele* and Agro-ecology	**Total number of household of sample *kebele*****			**Sample Household ***		
	Male Headed	Female Headed	Total	Male Headed	Female Headed	Total
Girar Geber - (*Dega*)	806	120	926	21	14	35
Torban Ashe - (*Woinadega*)	919	132	1051	24	16	40
Weddesso Amba - (*Kolla*)	628	44	672	15	10	25
Total	**2353**	**296**	**2649**	**60**	**40**	**100**

Note: * obtained depending on the above sampling technique

** obtained from basic data of Woreda Agriculture Office

3.4 Methods of Data Collection

Since food availability and staple access to food are critical to household food security, information was collected on the factors that play a role in limiting food availability and the options that households have for food access. Data were generated from both primary and secondary s urces to achieve the objective of the study.

Primary Sources of Data

The primary data were collected through various data collection methods such as field observation, household survey, focus group discussion and key informants.

Field Observation

Observation of the study *kebeles* was carried out before and during the study period. Prior to collecting data, different sites were visited to know the means of livelihoods, culture, basic social services and topography of the area. Information regarding peoples attitude, marketing mechanism, infrastructural activities such as access to feeder roads connecting to the main roads, basic social services such as human health posts, veterinary posts, schools, sources of water supply were obtained from personnel observation and by talking informally with peoples in their site. Field observation has contributed to substantiate some of the findings of the study.

Household Survey

To generate quantitative and qualitative information at household level, household survey was undertaken by developing structured questionnaires. The developed structured questionnaire was translated into the local language, '*Afan Oromo*' for the convenience of data collection during household survey. To achieve the objective of the study, enumerators were employed based on their ability in communicating with local language, educational background and experiences in similar works.

Prior to data collection period, the researcher planned to employ one enumerator for each study sites but the situation in the field demanded to decide on employing two enumerators for each study sites to ease the enumeration. Thus, household survey was conducted by selecting two development agents as enumerators for each study site (six development agents from each neighboring *kebeles* of study site). A two days training was provided to enumerators on the

procedure to follow while conducting interview with respondent and deep discussion were also held to make the questionnaire clear.

The survey was conducted on the selected hundreds households (sixty male and forty female). In order to avoid redundancy of respondent households and make the research valid, sampled households were selected randomly from *kebele* administration registration book.

Focus Group Discussion

In the study area, a total of six focus group discussions (two focus group discussions at each *gotts*) were undertaken. Initially, there was supposed to be a third FGD composed of both men and women, but this was unable to take off because women were too shy to express their ideas freely in the presence of men. Thus, only 2 FGD were done, one group composed of men (poor male headed household, medium male headed household, rich male headed household, elderly, and youth male) and another group includes women(poor female headed household, medium female headed household, better-off female headed household, elderly and youth female) each containing, five participants. Hence, the participants of the discussion were composed of different age groups and economic status. The participants expressed their own perceptions and offered their experiences on household food security condition.

To initiate their discussion, FGD guide was used to guide the discussion that was prepared in English and administered in local language to obtain relevant information pertinent to the objective of the study.

Key Informant Interview

To have deep understanding of food security situation of the area, in-depth interview were held with key informants. The interview was conducted to investigate their living condition in general and food security in particular and supplement the findings obtained through household survey. For individual in-depth interview, six household were selected (two household from each *gott*), So that, one female headed and one male headed household from each *gotts* were selected. Similarly, interviews were also held with the three *kebele* administrators, the three development agent, and the head of *woreda* agri culture office and disaster risk management office. The interview was conducted by preparing interview guides. The talks were mostly tape recorded with the permission of the interviewee in which the researcher handles the entire interview.

Secondary Sources of Data

Secondary source of information was reviewed to supplement the primary sources of information. Various documents available at *wereda* and *kebele* were reviewed and used to generate secondary source of information. Moreover, books, journal, articles, different GOs and NGOs documents and publications, and academic research papers were reviewed to understand household food security situation and enrich the findings.

3.5 Method of Data Analysis

Data for this study was generated through qualitative and quantitative method. Hence, qualitative and quantitative techniques were used to analyze data. Information generated from key informant interview, focus group discussion and personal observation was analyzed qualitatively. The quantitative data generated from household survey were coded and entered into computer for analysis. Hence, quantitative data were analyzed using computer software, Statistical Package for Social Sciences (SPSS). The data entered into the program were analyzed using descriptive statistics such as frequencies, descriptive, cross tabulation and Pearson chi-square test.

In addition, household food security situation of the study area was analyzed by using livelihood approach in which the analysis was relied on how the households themselves perceived their household food security situation. Moreover, Household Food Balance Model was utilized to quantify the available food for the sampled households in order to determine per capita kilocalorie consumed per annum in the household. In order to convert grains available in kilogram into equivalent kilocalorie, the conversion factors was utilized (see Chapter 5).

Chapter 4 : Access to Livelihood Resources/Assets

People require a range of livelihood assets to achieve positive livelihood outcomes. No single category of assets on its own is sufficient to yield the entire varied livelihood outcomes that people seek. Livelihood resources are the building blocks that determine livelihood activities and strategies. Since, livelihood system in the study area is dominated by subsistence small holder agriculture; agricultural resources are the major determinants of household livelihood. For the livelihood situation assessment and investigation, assets are the entry points (Devereux et al, 2003). Hence, the status of asset possession determines the livelihood situation of those households who are endowed with agricultural assets and can positively lead to a viable and sustainable livelihood in general, and food security in particular.

Livelihood analysis provides a clear image on how rural households pursue a range of livelihood strategies within the limits of their prevailing contexts. In the livelihood framework there are five core asset categories or types of capital up on which livelihoods are built. This includes natural, human, physical, financial and social asset/capital. Despite the variation in the level of importance, all assets categories are essential for household food security outcome in the study area.

4.1 Access to Natural Resources

Although there are various natural capital that influence household food security, farmland and water alone are considered in this study. The assumption here is that, access to land holding is one of the main factors that constrain or enhance farm production and which, in turn, would affect household food security condition.

As it is stated repeatedly, the livelihood of the study area depends on crop and livestock production. Crop production depends on access to arable land (its size and quality) while livestock rearing depends on the availability of grazing land and water. On the other hand, off-farm activities practiced in the area, such as handcrafts, sale of fire wood and charcoal are highly rely on the availability of natural resources such as vegetation for handicrafts and fire wood/charcoal production for sale. Therefore, access to natural resources and household food security condition is directly related in the study area.

4.1.1 Access to Land Resources

Land is considered as a vital asset in Ethiopian agriculture. The livelihood means of the majority of rural households by and large depends on access to and command over land resources. As a result, the issue of land goes beyond economic benefits and bear socio-cultural and political dimensions (Hussein, 2006).

For households where farming forms a major livelihood, land is an essential factor of production. The availability, accessibility, and fertility of land thus determine the levels of productivity of farming with other factors. The survey result shows that, 98 percent of households had access to land for agricultural use while 2 percent lack access to farmland for agricultural use (Table 4.1).

Table 4.1 Access to farmlands and ways of getting access to land

Actions	Response	Frequency	Percent
Access to farmland	Yes	98	98.0
	No	2	2.0
	Total	100	100.0
Main ways of getting access to farmlands	Through land distribution and sharecropping	25	25.5
	Inherited from parents	21	21.4
	Through land distribution	19	19.4
	Inherited from parents and sharecropped	13	13.3
	Through land distribution and inherited from parents	6	6.1
	Through land distribution and shared with relatives	5	5.1
	Purchased and sharecropped	4	4.1
	Shared with relatives and sharecropping	4	4.1
	Sharecropping	1	1.0
	Total	98	100.0

Source: Field survey, 2011

4.1.1.1 Ways of getting Access to Land

In Girar Jarso *woreda*, farmers have got access to land through land redistribution, inheritance or gift from parents, share cropping and the combinations of these. In the study area, the question of land is one of the serious issues that challenge agricultural production. Some FGD* participants indicate that, it is quite difficult to get farmlands formally through land distribution especially for the newly established households and demobilized soldiers headed households. Therefore, households access farmlands through informal ways such as sharecropping, inheritance, shared with relatives and purchased on rental basis. Most of the time, female headed households, disabled and elderly people who cannot operate their farmland sharecropped out their farm. In addition, lack of farm oxen and unable to purchase agricultural inputs causes to sharecropped-out farm plots. Households, who have enough farm oxen, labor as well as able to purchase agricultural inputs sharecropped-in farmland from these farmers so as to increase their farm holding and enhance household food security.

Among respondent households, 25.5 percent have accessed farmland through combination of land distribution and sharecropping while 21.4 percent owned through inheritance from parents (Table 4.1). The survey result also shows that, 19.4 and 13.3 percent of households have access to land through land distribution, and inheritance from parents and sharecropping, respectively.

4.1.1.2 Landholding Size and Its Dynamics

Landholding size under subsistence agriculture plays a significant role in the household food security situation. Many study revealed that, landholdings in many rural parts of the country are too small for adequate food production to meet the minimum household consumption requirements. For instance, Dessalegn (1997), Mesay (2001), Degefa (2002) indicate that, more than 60 percent of the rural households cultivate less than one hectare. Contrary to this, 74 percent of studied household have owned more than 1.25 hectare of farm land. This is due to the

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* Key informant (KI) interview and focus group discussion (FGD) participants are numbered as follows to cite them in the text easily hereafter.

KI1, KI2, FGD1 and FGD2 are belongs to *dega*,

KI3, KI4, FGD3 and FGD4 belongs to *woinadega*, and

KI5 and KI6, FGD5 and FGD6 belong to *kolla*.

Note: KI1, FGD1, KI3, FGD3, KI5 and FGD5 are female informants and participants while the rest are male.

fact that, more than 60 percent of households have access farm land through a combination of means such as sharecropping and purchase on rental basis. Hence, increase farm holding size of the household. In general, though holding size of the studied farmers seems larger than the estimated minimum holding mentioned above, diminishing landholding size is one of the main constraints to increase agricultural production and productivity thereby ensures household food security of the farmers in the area under study.

Accordingly, among households who had farmlands, 40 percent and 29 percent have own 1.25- 2 hectare and 2.25-3 hectare of farmland, respectively (Table 4.2). Similarly, the result shows that, 24 percent of respondents have 0.25- 1 hectare of landholding. The remaining 4 percent of the studied households have own 3.25- 4 hectare, and 1 percent holds farmland more than 4 hectare.

Table 4.2 Farm landholding category of the study area

Holding size category in hectare	Frequency	Percent
No farmland	2	2.0
0.25-1	24	24.0
1.25-2	40	40.0
2.25-3	29	29.0
3.25-4	4	4.0
>4	1	1.0
Total	100	100.0

Source: Field survey, 2011

With respect to changes occurred to farmer's landholding size over the last ten years, 64 percent, 27 percent and 7 percent of households responded as declined, no change and increased, respectively. The main reasons for the decrease in landholding size include decline in quality of land, having large family size and natural disaster. The survey result shows that, quality of farmland has declined due to prevalence of severe soil erosion causing part of farmland unusable and having large family size causes change in landholding size by sharing part of farmland to children. Similarly, natural disaster such as landslides and flood particularly in *kolla* areas causes landholding size to decrease.

Among households whose farmland shows a declining trend, 44 percent, 30 percent and 13 percent respond that, their farmland had becomes decreased due to declining in quality of land, for having large family size and declining in quality of farmland, and having large family size, respectively (Table 4.3). The remaining 11 percent had responded that, their farmland has declined due to other reason such as landslide, water erosion and losing land for various development activities such as health posts, school and road construction, and the rest 3 percent had replied that their farmland had decreased due to land distribution especially for demobilized soldiers.

Table 4.3 Changes in size of farm holdings

Action	Responses	Frequency
Change in size of farmland	Increased	7
	decreased	64
	no change	27
	Total	98
Reason for farm ands to decrease	Decline in quality of land	43.8
	Large household size and decline in quality of land	29.7
	Large household size	12.5
	Land distribution	3.1
	Others	10.9
Total		100.0

Source: Field survey, 2011

Question regarding rate of sufficiency of farmland were raised to households who had access farm land and replied that, farmland was scarce for 65 percent, and it was sufficient for 35 percent of households.

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4.1.1.3 Land Productivity

Land productivity is one of the major necessities for growth in agricultural sector particularly, crop production. Productivity refers to the amount of yield obtained per unit of land. When the amount of yield harvested from a plot of land rises without expanding landholding food production could also rise through time. Hence, not only access to farmland that matters, but the most important thing is fertility status of farm holdings. If the fertility status of farmland is good, farmers can able to boost farm production given small size of farm holding. With regard to farmland productivity, KI2 described that "*having large farmland with poor soil fertility is only counting the number of farm plot; therefore, having small farmland with good fertility status of soil matters more than having large farm with poor soil fertility*". The result of the study showed that, 72 percent, 25 percent and 3 percent of respondent households who own farmland responded that productivity of their farmland is medium, quite poor and good respectively.

Table 4.4 Fertility level of farmlands

Fertility level	Frequency	Percent
Poor	71	72.4
Moderate	24	24.5
Good	3	3.1
Total	98	100.0

Source: Field survey, 2011

The main factors constraining farmland productivity and causing decline of food production in the study area are soil erosion, water logging, poor soil fertility and the like. Informants of in-depth interview and FGD participants specified that recurring drought, poor soil fertility, high rate of soil erosion and reduced quality of land resources severely limits the potential for agricultural production. The survey result shows that, poor soil fertility is the main constraints to farmland productivity for 98 percent of households while soil erosion was constraints for 96 percent. Similarly, 86 percent and 63 percent had replied that water scarcity and frost attack respectively are the main constraints to farmland productivity (Table 4.5). Households were responded on the causes of constraining factors results in decline farmland production and productivity. As a result, removal of natural vegetation and population pressure are the main factors that aggravate the problem of decline in farmland production and productivity.

Table 4.5 Percentage distribution of main constraints to farmlands

Reason	Yes	No	Chi-Square	df	Asymp. Sig.
Poor soil fertility	98	2	92.160	1	.000
Soil erosion	96	4	84.640	1	.000
Water scarcity	86	14	51.840	1	.000
Frost	63	37	6.760	1	.009
Water logging	43	57	1.960	1	.162
Highly sandy	43	57	1.960	1	.162
Wild life attack	22	78	31.360	1	.000
Salinity	13	87	54.760	1	.000

Source: Field survey, 2011

As it is observed from Table 4.5, there is a significant association between the main constraints to farm lands such as, poor soil fertility, soil erosion, water scarcity, salinity, wild life attack and household food security situation. However, water logging, highly sandy soil and frost attack are not significantly affecting household food security (P>0.005). This shows that, water logging, sandy soil and frost attach does not cause farm land constraints and affect household food security situation.

Respondent households were asked to rank out the aforementioned problem and 54 percent were put poor soil fertility as the primary problem that hinder farm productivity and thereby reduce crop production, which, in turn, would leads household to food security problems. In order to maintain and replenish damaged farmlands and thereby enhance farm production, households used farmland management practices such as BBM, crop rotation, manure (compost) and intercropping. The result shows that, 92 percent use manuring, intercropping, crop rotation and compost making to maintain and replenish fertility level of farmland. Similarly, various soil conservation practices such as terraces, soil bunds and stone bunds are practiced in order to reduce soil erosion and protect fertility of soil in the study area. Consequently, farmland management practices results in improved agricultural production and increase household food availability.

4.1.2 Access to Water

Water is life. It serves for washing, cleaning, cooking, drinking and growing crops, mostly fruits and vegetables. Access to sufficient amount of potable water for human being is considered as one of the determinant of household food security. Similarly, the presence of sufficient amount of water for livestock consumption and crop production contribute to reduce vulnerability to

drought. Hence, sufficient source of water is essential to diversify sources of household livelihood and lead farmers to improve household food security (Hussein, 2006).

The main sources of water for household and livestock consumption, and other agricultural uses in the study area are river, protected and unprotected spring water, piped water, and hand-dug wells. The potable water supply coverage in the *woreda* is 68 percent (WFED, 2010). Thus, one can assume the scarcity of water supply in Girar Jarso *woreda.* Some FGD participants in Torban Ashe *kebele* indicate that, "*scarcity of water supply exacerbates the vulnerability of our livelihoods. We need water for irrigation purpose but it is difficult to access. We spent more time finding of clean water for livestock consumption. Of course, our kebele has potential for sources of spring water but it is protected and let-out for urban dweller*". Thus, despite low amount of water availability and poor sanitation, piped water is widely used for human and livestock consumption as well as irrigation purpose.

Figure 4.1 Piped water as a source for human and livestock consumption: piped water used for human consumption (left), and livestock consumption (right)

Source: Field survey, 2011

Regarding sources of water, 61 percent of households used piped water while 10 percent used unprotected spring and piped water sources for human and livestock consumption, and other agricultural purposes (Table 4.6). Likewise, 11 percent of respondents used river and piped water sources, while another 11 percent utilize river and unprotected spring sources of water. The remaining 7 percent of the respondents mentioned unprotected spring as their main source of water.

Table 4.6 Main sources of water used in the study area

Sources of water	Frequency	Percent
River and unprotected spring	11	11.0
River and piped water	11	11.0
Unprotected spring	7	7.0
Unprotected spring and piped water	10	10.0
Piped water	61	61.0
Total	100	100.0

Source: Field Survey, 2011

Even though most households in the study area use piped water, the rate of water availability for human and livestock consumption is not sufficient. The survey also substantiates this reality. The rate of current water availability was insufficient for 75 percent of studied households while sufficient only for 25 percent of households.

In areas where rainfall is erratic and scarce such as in Girar Jarso *woreda*, augmenting production and productivity will be possible through the application of irrigation provided that water for irrigation purpose is available. Of course, the availability of water resources cannot be enough to irrigate farmlands. Even if source of water is a necessary condition, farmers' awareness, skill and experience on the use of water for irrigation, availability of technologies such as motor pumps, farm inputs, and suitability of the farmland for irrigation are also important.

According to some key informant interview and FGD participants, water scarcity is the main problem that hinders crop and livestock production, due to shortage of rainfall and removal of natural vegetation. Hence, the amount of river and spring water is minimal in the study area. Currently, since the only source of water nearby farmers homestead is piped water; there is a great competition between water users and the purposes attached on water. Despite its low potential during dry season, there are many small river and springs utilized for animal and livestock consumption in the area under study. These rivers are also suitable for small scale irrigation activities by constructing traditional diversion canals. However, due to its low potential during dry season, the upper beneficiaries and the lower beneficiaries are competing for the water resources. In this regard, the survey on access to irrigation shows that, 41 percent practiced

irrigation to produce vegetables such as onion, cabbage and different types of seedlings while the rest households do not practice irrigation.

Figure 4.2 Farm for onion production in Girar Geber *kebele*

Source: Field survey, 2011

4.2 Availability and Utilization of Labor

Human capital as a livelihood resource consists of the skills, knowledge, ability to labor and good health and physical capability that are important to pursue different livelihood strategies (Scoones, 1998). In order to create livelihood, therefore, people must combine the human capital with other capital endowments that they have access to and control over resources (Melese, 2007). At household level, human capital is a factor of the health and education of available labor, which varies from household to household.

4.2.1 Labor Availability

Labor is one of the important production resources in Ethiopian agriculture. The availability of sufficient labor enable household to produce more on the available size of farmland. Therefore, labor availability and proper utilization in the household helps to understand economic status and food production condition of the household which, in turn, determine household food security situation.

With regard to the labor availability, demographic characteristics of the respondents indicate that, 97 percent are economically active and they are able to work and do not have significant labor

shortage to work on their farms. Hence, labor availability is sufficient in the study household. But, the remaining 3 percent indicated that, they do not work due to health and age problem. As a result they face labor shortage at peak harvest seasons. Respondents added that, it is difficult to get labor in cheap wage labor at harvest and weeding seasons, hence, obliged to pay higher costs. But, it does not seem that there is chronic shortage of labor that hampers agricultural activities at large in the study area. Because those households who cannot afford to pay high labor wage harvest their crop production on the basis of community support.

4.2.2 Health

Another important aspect of human capital is the health situation of individual households in a society. Poor health status, poor nutrition and inadequate sanitations facilities are the most important factors that undermine household food security particularly the household food utilization. On the other hand, health problem is the other pressing factor which determines household food availability. The reason is obvious; health status affects individual household participation in any agricultural and non-agricultural activities. Access to health service for human and livestock is a major problem particularly for the lowland *kebeles* because of the lack of health services nearby. Even, existing health post does not provide regular services. During focus group discussion held at Weddesso Amba *kebele*, the participants' raised malaria as the main causes of health problem in the area. Given poor access to health services especially for livestock, disease prevalence and the frequency of deaths resulting from various infectious diseases have increased. This causes low agricultural production and productivity and enhances household food insecurity.

4.2.3 Education

Education is a power mechanism for building human capital. Adoption of technologies generated from research centers, getting knowledge and information from development agents, communication and protecting the right to get access to resources, reducing poverty and food insecurity are easier for literate farmers than illiterate (Melese, 2007). Hence, education status of the household, specially, household head, determine capacity of household to enhance agricultural production and result in better household food security condition.

Even though most farmers in rural areas had experiencing in indigenous knowledge that have developed through their life which helps them in maintaining environmental resources and seeks

solution to problems facing them (Degefa, 2005), being literate, illiterate and ill health have directly related to food security through production management and household nutrition aspect.

Regarding respondent households' educational status, 44 percent, 33 percent and 23 percent of respondents are illiterate, read and write, and literate, respectively. Accordingly, FGD4 indicate that, "*Currently education on extension service is delivered to farmers in FTC which would enhance awareness on modern farm production and how to work with new technology in general. Hence, though our farmers cannot able to read and write, currently almost every household are literate*".

4.3 Livestock and Farm Oxen Possession

Livestock play a vital role in farming systems of the studied farmers. Livestock contributes to the study *kebeles* in several ways such as serving as a source of food, manure, income, transportation and traction power. Likewise, similar to land holding size, sizes of livestock owned by the household highly determine food security condition. Moreover, households who have large number of livestock maintain better social credibility and status even at times of production shortfall. Furthermore, Degefa (2002) in his study conducted in Oromia zone revealed that, livestock possession is considered as a means of security and coping mechanism at times of food shortage.

The findings of the survey result shows that, 96 percent of the samples in the study area have raised different types of livestock, poultry and bee hives. In most cases, farmers' sale small animals such as sheep, goats, calves and heifers to generate cash income that could be used for household expenses such as food purchase, social and religious expenses, pay tax, school fee and other expenses. The smaller number of livestock types, mostly calves that had grown to farm oxen causes the future potential of households to access enough draught power questionable (Table 4.7).

Table 4.7 Livestock possession of households in the study area

Livestock types owned	Number of livestock owned
Cows	121
Bulls	43
Heifer	71
Calves	51
Sheep	266
Goats	22
Horses	20
Donkeys	85
Mules	3
Chicken	321
Honey bees	6

Sources: Field survey, 2011

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According to data obtained from survey result, the main constraints to livestock rearing in the study area include shortage of grazing land, lack of additional fodder, prevalence of animal diseases, poor veterinary services and shortage of water for livestock consumption. The result of the study showed that, lack of grazing land, additional fodder and shortage of water is high for 45 percent, 39 percent and 24 percent, of households respectively. Animal production experts of the *woreda* also added that, the occurrence of various animal diseases (black leg, anthrax, FMD, pasterellosis, sheep pox and so on), internal and external parasites as the main constraints to livestock production, and cause the number and productivity of livestock's to reduce.

The most productive animal used for ploughing in Ethiopian agriculture is oxen. Like the area under study, the importance of having sufficient draught power obtained from oxen determines the production capacity of households in traditional agriculture of Ethiopia. Households that lack oxen typically face problems in farming their land, being dependent on borrowing or hiring oxen from others. Households who cannot afford to maintain a pair of oxen are either destitute or vulnerable (Devereux et al, 2003). Dessalegn (1997) also argue that, since the role of oxen under

the Ethiopian peasant economy context is very high, lack or no oxen possession can be the cause of food insecurity. The findings show that, 68 percent of household have access farm oxen while 32 percent have not access to farm oxen. Small portion of households in the study area practice hoe culture particularly in *kolla* areas where there is inaccessibility to reach cultivation area by farm oxen (Figure 4.3) in general and those households who had no access to farm oxen in particular.

Figure 4.3 A farmers ploughing the farm with a pair of oxen and practice hoe culture where inaccessible with farm oxen

Source: Field survey, 2011

Even though access to farm oxen has paramount importance, only 42 percent of the samples have a pair of oxen and able to cultivate their farmland without requiring external support of draught power (Table 4.8). Accordingly, 11 percent of respondents possess one ox so that, ploughing for these household is possible by pairing farm ox with other households on the basis of borrowing oxen from relatives and *qixira*, a system of oxen use arrangement in which households who lack farm oxen rent in an ox or more to use its draught power. But, some informants and FGD participants added that, renting in farm oxen on *qixira* basis incurs higher cost, that is why most households that do not own a pair of oxen prefer to sharecropped out their farmland rather than renting in farm oxen. Among the sample households, 8 percent and 7 percent possess three and four oxen respectively.

Table 4.8 Farm oxen owned by sampled households

Farm oxen category	Frequency	Percent
No farm oxen	32	32.0
One	11	11.0
Two	42	42.0
Three	8	8.0
Four	7	7.0
Total	100	100.0

Source: Field survey, 2011

4. 4 Availability and Utilization of Agricultural Inputs

Any farm input that augments agricultural productivity is expected to boost the overall production. This contributes towards attaining household food security (Brown, 2004). It was repeatedly indicated that, Girar Jarso *woreda* has poor soil fertility with eroded soil. This is meant for the need to use farm inputs to improves agricultural production and productivity. However, according to data obtained from *woreda* agriculture office, the number of households who used farm inputs are smaller and shown a declining trend due to rise in price of farm inputs and inappropriate time of distribution particularly chemical fertilizer and improved seed. The survey result shows that, 93 percent of households are used farm input though the amount of input utilized per hectare of land is not indicated appropriately. Accordingly, 31.2 percent of households use fertilizer, improved seeds and herbicides together. Similarly, 25.8 percent of households utilize fertilizer and herbicide only (Table 4.9). Besides, 16.1 percent of respondents apply fertilizer alone on their farmlands.

According to the findings of the study, the proportion of fertilizer application is higher as compared to improved seeds and herbicide application. This shows the severe problem of poor soil fertility in the area. Hence, in order to enhance farm production in general and food production in particular farmers utilize chemical fertilizer. However, inappropriate technological application and poor input utilization contribute a great share to low agricultural productivity that leads to low crop production. Consequently, it leads to low food production and erodes the capability of households to feed their family from own production.

Table 4.9 Access to farm input and types of input utilized in the year 2010

Actions	Responses	Frequency	Percent
Access to farm inputs	Yes	93	93.0
	No	7	7.0
	Total	100	100.0
Types of modern farm inputs utilized	Fertilizer only	15	16.1
	Fertilizer and improved seeds only	21	22.6
	Fertilizer and herbicides only	24	25.8
	Fertilizer, improved seeds and herbicides	29	31.2
	Fertilizer, improved seed, herbicides and pesticides	4	4.3
Total		93	100.0

Source: Field survey, 2011

4. 5 Access to Rural Credit

Rural credit has emerged as alternative source of cash income for rural households with financial constraints. Farmers need rural credit to purchase agricultural inputs such as chemical fertilizers, improved seeds, and farm implements and for startup capital to participate in nonfarm income generating ventures. During the crises of food shortage farmers need credit services to purchase food item and feed their family. Hence, access to credit services plays a significant role to ensure household food security. Some key informants noted that, most of the households use money through credit to fill their cash deficit rather than using to create some productive assets such as buying livestock. As it is stated in chapter three of this study, rural credit is extended to farmers engaged in non-farm activities from financial institutions such as Farmer's Service Cooperatives, Oromiya Credit and Saving Institutions and local NGOs such as Wisdom and ANPPCAN Ethiopia.

The result of study shows that, 83 percent of households have access to credit services either from formal institutions and private money lenders. However, Degefa (2005) in his study revealed that private money lenders causes mistrust among them and become a major problem to obtain credit. On the other hand, there is an attempt to know the reasons of respondent of not accessing credit from formal financial institutions. As a result, about 56 percent of households

could not access credit services from formal institutions due to inconveniency of methods of lending institution and unfavorable payback period which is restricted with harvest time when grain price is low at market hence require high amount of food crop to sale out. KI6 indicated that, *households who faces financial problem obtain rural credit from private money lenders in some cases but require high interest rate for the rented money.* To sum up, though private money lenders require high interest rate and cause mistrust, households access credit services easily during crises.

4. 6 Social Net Works and Relations

Social resources are networks and connectedness either vertical or horizontal that increase peoples trust and ability to work together and expand access to resources. Rural society is endowed with various traditional institutions with different purposes, functions and membership (Tsegaye, 2008).

Social capitals which are widely practiced in the study area are labor sharing mechanism such as *debo/jigi,* labor sharing mechanism in which households mobilizes large number of individuals to work on his/her farm land mostly without reciprocation, *wenfel,* labor sharing mechanism among households on the basis of reciprocation with equivalent labor, and *humna,* a mechanism of labor assistance/support to a household in need of labor. The findings of the study also show that, 94 percent of household participate in community labor organization especially *debo/jigi* and *wenfel.* Apart from these, households are participating in group work for disabled and elderly person on the basis of *humna*. This showed that, there is strong tie with in households regarding community labor organization in the study area.

On the other hand, community based organizations such as *iddir, mahiber* and *senbete* are also widely practiced in the area. The surve y result shows that, 98 percent of households have participating in community based organization. Moreover, disable and unable person take part in community based organizations and a single household may take part in more than one institution depending on resource endowments of the household.

However, it was understood from most of FGD participant that, most of the institution do not contribute to in mediating access to resources for the livelihood and food security instead they are meant for sake of membership.

Chapter 5 : Household Income, Expenditure and Consumption Patterns

Food is a basic need for mankind. This important item should either be produced at the household level through own production or accessed through means of purchase, gifts, or transfer. Both producing and purchasing food needs sizeable amount of assets from households. Receiving food through gifts and other transfer means, themselves, needs assets such as material responses, worth sharing ideas/thoughts and good social capital (Degefa, 2005). Furthermore, Degefa revealed that, households that lack material resources but have relatives and good social life do not go hungry. At least they share the existing resources with their relatives of good days. Contrary to this, household's that have no relatives and limited social participants, feel lonely, alienated, helpless, and defenseless. Such households lack social capital and can be classified as poor. Hence, the level of asset ownership of households and their capabilities to make assets determine household food security situation.

5.1 Household Income

Subsistence rain-fed agricultural production is a major employment and source of income in the study area. However, the sector gives low output. Likewise, other source of income like nonfarm employment is put in place to supplement farm income and support the cash needs of households for various expenses such as purchase of productive materials, food items and non food item. Otherwise, these expenses are covered by selling limited food crops produced or animals kept including farm oxen.

The findings of the study show that, cash income from sale of livestock and their products makes the largest share 33.8 percent of household income. The second important source of cash income is sale of grains. It makes 29.5 percent (Table 5.1). The other source of cash income is sale of fruit and vegetables which is restricted to *kolla* areas, and accounts 9.4 percent of the total income. Income obtained through casual labor wage also contributes 7.6 percent of total household income. Most household members especially children are engaged in casual labor during weeding and harvesting. Hence, contribute to enhance purchasing power of households.

On the other hand, though the income obtained from livestock production takes higher proportion, income from sale of *kube*t makes insignificant proportion of households' source of income. This may be due to the use of cow-dung for manuring/compost making.

Table 5.1 Main sources of cash income of sampled households in 2010

Main Sources of income	Frequency	Percent	Total income (Birr)	Percent contributes	Income per HH (Birr)
Livestock and livestock products	69	69	208130	33.8	3016
Grain products	62	62	182100	29.5	2937
Chicken and chicken products	53	53	19760	3.2	373
Eucalyptus trees	19	19	24800	4.0	1305
Firewood and grass	14	14	6450	1.1	461
Kubet and charcoal	8	8	3800	0.6	475
Local drinks	6	6	3750	0.6	625
Petty trade	5	5	11870	1.9	2374
Rural credit	10	10	12000	1.9	1200
Wage labor	24	24	46700	7.6	1946
Fruit and vegetables	12	12	58000	9.4	4833
Gifts	18	18	11000	1.8	611
Handicrafts	17	17	28400	4.6	1671
		Total	616760	100	6167.6

Source: Field survey, 2011

5.2 Household Expenditure and Saving Pattern

Source of income alone does not give households' net income and saving conditions because, expenses of the household are not partly shown. Therefore, this section discusses the main expenses of the household and pattern of saving.

The survey result shows that, purchase of food items takes the highest share in the expenditure pattern of households. This indicates that, households in the study area spend more on food items as compared to other expenses. As a result, 31.3 percent of the total expenditure is allocated to purchase food items. The result shows that, 85 percent of households purchase food item from

market for home consumption. Thus, food products obtained from farmers own production is not sufficient to cover annual food consumption for majority of households.

Miscellaneous expenses including food items which could not be memorized by households to compute, non food items, and various home expenses also take largest share of household expenditure making 22.5 percent of total expenditure. The third category of expenditure is purchase of farm input which accounts 14.7 percent. This by itself indicates that, an effort made by the household to purchase farm input, to improve farm production thereby ensure household food security is minimum (Table 5.2). The result also shows that, religious expenses such as *mahiber*, *senbete* and *teskar* take high share of household expenditure pattern making 9.03 percent.

Table 5.2 Major annual expenses of sampled households' in 2010

Main expenses	Frequency	Percent	Total expenses (Birr)	Percent shares	Expenses per HH (Birr)
Purchase food item	85	85	189290	31.3	2201.1
Pay tax	93	93	13800	2.3	148.4
Religious expenses	93	93	54697	9.0	588.1
Weeding	4	4	22000	3.6	5500
Rural credit	32	32	34805	5.8	1087.7
Purchase farm input	87	87	89194	14.7	1025.2
Bought clothes	64	64	46305	7.7	723.5
School fee	58	58	9620	1.6	165.9
Medical expenses	17	17	9810	1.6	577.1
Other miscellaneous expenses	100	100	135900	22.5	1359
		Total	605421	100	6054

Sources: Field survey, 2011

Despite diverse sources and amount of income obtained the expenditure of household matter most in the saving condition of household. Saving enables households to purchases food items and create basic assets (Mesay, 2001). But, the finding of the study shows that, the poor saving condition of respondent is due to high home expenses. Moreover, household expend significant amount of their income to offer various social and religious feasts like wedding, *teskar*, *mahber*, religious and holiday celebration and results in low rate of saving.

Participants of FGD2 indicate that, the main cause of food insecurity in the area is not due to lack of resources but due to poor saving habit. To write what they noted during the discussion in words "*Rakkon midhaan nyaata kan nama keessatti dagaage galcha dhabaa miti, shaniin dhuganii shantama gatuutti malee*" (Afan Oromo) which is literally mean, it is not poor harvest that induces the problem of food insecurity but due to lose of fifty while drink in five. This signifies the contribution of local drinks especially *areqe,* a local drink made from cereals in the home through distillation by local peoples, to the poor saving habit of the community in general and respondent households in particular.

5.3 Household Consumption Pattern and Sources of Food

As it is discussed in Chapter 3, cereals are the major sources of food produced by the study households. Among these, *teff*, wheat, barley, sorghum and oats are dominantly produced. Hence, these crops are the most staple food in the communities under study. Beside, pulses such as bean, peas, field pea, vetch and lentils, and oil seeds like *nug* and linseed are produced widely in the study area. The other sources of food are livestock products like eggs, milk, butter and meat. However, currently most of the households do not use such products for home consumption. This is because, the number of livestock owned has decreased significantly due to shortage of grazing land and continuous sell of small animals like calves and heifers to bridge the food gaps through purchasing. Even, those households who have access to enough dairy cattle's have not consumed livestock products such as milk and butter in the home due to the priority given to sell such products to earn cash income. Apart from livestock and crop production, fruit and vegetables are produced in the study area especially in *kolla* areas.

Generally speaking, cereal and pulse grains are the main source of dietary energy supply of households, which could be obtained from own production, purchase from market, food

aid/relief, and borrowing from relatives. The finding of the survey shows that, food grains that are obtained from the household's own production covers 79.5 percent of the total amount of grains available (Table 5.3). A considerable amount of total available food grains are obtained through other entitlement means including purchase from market (14.6 percent), and receiving through relief (5.3 percent).

Table 5.3 Major sources of food grains for the sampled households in 2010

Sources of food grains	Frequency	Percent	Total amount of grains (Kg)	Percent covers
Own production	98	98	186875	79.5
Purchase	85	85	34305	14.6
Borrow from relatives	8	8	1400	0.6
Relief aid	25	25	12401	5.3
		Total	**234981**	**100**

Source: Field survey, 2011

Moreover, some participants of FGD expressed that food produced on farmers own production do not covers annual food requirement of a households. Hence, supplement own production with purchase from market (exchange entitlement) to extend their household food availability. This implies that, farmers that have produced white *teff* have sold out and purchase red *teff* which are low in price, while in some cases exchange with sorghum other than consuming white *teff* partly. For instance, farmers who have sold out 100kg of white *teff* have purchased 100 kg of red *teff* and 50 kg of sorghum in the year under study. This is commonly practiced with farmers whose own production is not sufficient to cover annual food requirements in the study area. In addition, food crops such as bean and vetch are produced not only for home consumption but for exchange with sorghum in *dega* and *woina dega* areas. Generally, food crops produced from farmers own production do not sufficient to cover annual food requirement of community in the study area hence, they use different entitlement means to access the required amount of food.

5.4 Availability of Food Grains and Dietary Energy of Households

As it is stated in chapter two of this study, the mere availability of food in a country or region does not guarantee households to access and command over the needed amount of food. This does not mean that availability plays no role in the household food security. When the issue of food security is brought down at the household level, availability plays a significant role. Hence, the issue of household food availability and adequacy for the demand of the household is discussed in this section.

In order to quantify the net available food for the households, Household Food Balance Model is utilized. The model is modified form of the Regional Food Balance Model (Degefa, 1996, 2002). The researcher also slightly modified and used the model to compute the total available food in the sampled households. The data used for the computation are generated through field survey except for the estimates given for the total seed reserve and post-harvest loss due to poor storage facilities. Mesay (2001:73) citing Tegenye, et al. (1999) revealed that, farmers reserve 5 percent of their total food produced for seed while post harvest loss are estimated as 10 percent Degefa (2002) of the total yield of a household produced. These estimates are used to quantify the total grain used for seed and the amount of grain lost due to poor storage and other problem by the household. The Household Food Balance assessment covers a period between November 2009 and November 2010. The model is given by the following mathematical expression.

$$Nij= (Cij+Pij+Bij+Fij+Rij)-(Hij+Sij+ Mij)$$

Where, Nij - is the net food available for household i in year j

Cij - is the total crop produced by household i in y

Pij - is total grain purchased from market by household i in year j

Bij - is the total food household i borrowed in the year j

Fij - is the total grain obtain through FFW by household i in year j

Rij - is the total relief food received by household i in year j

Hij- is post harvest losses out of total output produced by household i in year j

Sij - is amount of grains utilized for seed by household i in year j

Mij - is total grain marketed (sold out) by household i in year j

Per capita dietary energy supply measured in calorie also called kilocalorie, is the single most important indicator of adequacy of food available in the household. Per capita kilocalorie measures the average daily food available to each person in a country or region in general and household in particular (FAO, 1998 cited in Mesay, 2001).

Though the amount of calories a person needs depends on the person's sex, age, body builds, degree of physical activity, agro-ecology and the type of soil on which the crop has sown, the average values are taken into consideration to ease the analysis of the available daily dietary energy supply of households. Therefore, the researcher has, converted the households' annual available food grain supply into daily dietary energy equivalent using Ethiopian Health and Nutrition Research Institute (EHNRI)'s food composition table (Degefa, 1996 and Mesay, 2001). This was done after computing the balance between food grains gained and lost using the simple equation developed above.

In order to convert grains available in Kg into equivalent Kcal, the conversion factors are utilized. Mesay (2001), in his study conducted in Kuyyu *woreda* shows that, before starting the conversion process, the average caloric value per 100 gram of each type of food grain has to be computed based on the kind of food that the community consumes in most cases. This is because the calorie equivalent of the grains varies by the kind of the end product prepared for consumption. For instances, a 100 gram of wheat grain (white) produces a dietary energy equivalent to 142.60 Kcal when prepared in the form of bread and 145.60 Kcal when it is consumed in the form of *injera*. Therefore, the average value of the major end product of each crop has taken into consideration for the conversion processes to obtain the total dietary energy of available food crops for consumptions.

As a result, all the net available grain quantities were converted into calories equivalent using the conversion factors shown in Table 5.4. The average food energy per unit gram of grain was multiplied by the total volume of each kind of grain to convert into dietary energy available of the household.

Table 5.4 Major traditional food types in the study area and their average energy composition

Crop type	Form of food stuff	Equivalent energy Kcal per 100gm
Teff	*Injera,* porridge	182.38
Wheat	Bread, porridge, *nefro* (boiled), *qollo* (roasted), *injera, qenche* (split then boiled)	196.38
Barley	*Injera*, porridge, *qinche*, *qollo, tella* (roasted)	243.8
Sorghum	*Injera, nefro, kollo, tella*	177.85
Oat	Bread, *qinche*, porridge	200.35
Pulses	*Nifro, qollo, kik* (split), *ashuqi* (roasted and then boiled)	197.62

Source: Computed based on EHNRI's food composition table

The total amount of net available food grain for household consumption is obtained from survey result and revealed in Table 5.5. The result shows that the total amount of food energy available for the households was 34,745,491 kcal, giving the average daily per capita volume of 951.9 kcal. When compared to the Minimum Recommended Allowance for an adult, 2100 kcal, the available dietary energy is only 45.3 percent of the recommended daily allowance.

Table 5.5 Net food source grains available for the sampled households in 2010 crop year

Food source	Net available grain for consumption (kgs)	Dietary energy of 100gm edible part (kcal)	Total dietary energy equivalent (kcal)	Contribution value to total dietary energy supply (%)
Teff	39158.75	182.38	7,141,772.83	20.6
Wheat	33486.25	196.38	6,576,029.78	18.9
Barley	23962.5	243.8	5,842,057.50	16.8
Sorghum	37142.5	177.85	6,605,793.63	19.0
Oat	12022.5	200.35	2,408,707.88	6.9
Pulses	31227.25	197.62	6,171,129.15	17.8
Total	177000		34,745,491	100

Source: Field survey, 2011

In addition, the distribution of dietary energy available of the household is considered. As it is observed from survey results, households incur wider gaps in the dietary energy available to them. The gap is revealed between minimum and maximum value of the available energy. There are households who get 194 kcal of available dietary energy whereas others, indeed few in number, get up to 2557kcal (Table 5.6). Here, the researcher would like to compare the maximum dietary energy available to a household with two neighbor *woreda* of the same zone, Kuyu and Wuchale-Jidda *woreda*. The study conducted by Mesay (2001:79) in Kuyu *woreda* revealed that, the maximum dietary energy available to a household is over 3000 Kcal while study conducted by Hussein (2006:109) in Wuchale-Jidda *woreda* revealed 2560 Kcal. This shows the poor dietary available of the household in Girar Jarso *woreda.*

Table 5.6 Distribution of dietary energy available in calories for the sampled households

Range of dietary energy (Kcal)	Frequency	%	Minimum Dietary energy available (kcal)	Maximum Dietary energy available (kcal)	Mean Dietary energy available (kcal)	% of MRA
<700	33	33	194	695	521.9	24.9
700-1400	51	51	700	1397	971.9	46.3
1400-2099	11	11	1413	1783	1561.91	74.4
exactly 2100	1	1	2100	2100	2100	100
>2100	4	4	2151	2557	2282.25	108.7
Total	100	100	194	2557	931.9	44.3

Source: Field survey, 2011

According to Table 5.6, only 5 percent of the household meet the minimum recommended dietary energy. Besides, 11 percent of the households get up to 67.3 percent of the minimum recommended dietary energy, while, the remaining 84 percent of the households get only about 33.3 percent of the minimum recommended daily allowance. Although this may need further investigation, it is possible to conclude that, 84 percent of respondent in the study area are food insecure.

The finding indicates that the per capita dietary energy available for the household varies by agro-climatic zones. The mean value shows that the households in *dega* areas were better than those in the other parts of the study area while households in *qolla* areas found in a better position than *woina dega* areas. Actually, *kolla* areas were expected to be the most food insecure areas than *woina dega* areas. However, in the year under study, most households of the study area face crop failures. Unlike other areas of the study *kebeles*, the residents of Weddesso Amba *kebele* were hit by landslide in the year under study. Hence, receive relief food for the last nine months of the year under study. Due to this factor, the total food available to the household increased for *kolla kebele* and raises the available per capita dietary energy than *woina dega kebele*. With this, the average daily per capita calorie supply of *kolla* area is 951 Kcal, which is 45.3 percent of MRA.

Table 5.7 Distribution of average dietary energy available by agro-ecologies

Agro-ecology	Frequency	Total Kg	Total Kcal	Minimum	Maximum	St.dev.	Mean	% of MRA
Dega	35	66141	36437	426	2557	441.7	1041.1	49.6
Woina dega	40	64118	34982	194	2151	479.9	874.5	41.6
Kolla	25	46741	23775	424	2161	462	951	45.3
Total	100	177000	95193	194	2557	463.4	951.9	45.3

Source: Field survey, 2011

5.5 Factors Affecting Availability of Sufficient Dietary Energy to Households

A number of studies undertaken in different parts of Ethiopia identify various determinants of food security like livestock ownership, farmland size, family labor, farm implements, employment opportunities, access to market, levels of technology application, status of education, health, weather conditions, crop diseases, rainfall, oxen, and family size. Demographic, biophysical and productive assets affect agricultural production in general and availability of food supply in particular. According to the survey results large proportion of food grain of households are obtained from their own production as compared to other means of food acquisition. Hence, any factor that disrupts agricultural production has adverse impact on household food availability and dietary energy of households.

5.5.1 Demographic Characteristics of the Households

In rural Ethiopia, the demographic characteristics of household head highly influence the household livelihood and food security which, in turn, would influence the type and amount of food available from different sources (Degefa, 2002). Therefore, demographic characteristics such as sex, age, educational status and family size are expected to influence household food availability and dietary energy of the studied households.

Regarding to sex of household head, an attempt was made to analyze the difference of available per capita dietary energy that exists between female-headed and male-headed households. The result of the study indicates that, the mean dietary energy of households headed by male and female was 1041.4 kcal and 817.7 kcal, respectively. Hence, it is possible to conclude that, the difference in sex of household head may influence the households' food availability and per capita dietary energy of the household.

Education is another factor which is thought to influence available dietary energy of households. The basic premise here is that, educated households have possible advantages of increasing agricultural production and productivity by means of adopting new technology and farm practices earlier, which, in turn, would enhance households' food availability. The survey result shows that, the mean dietary energy of household head who can read and write was relatively higher (1063.7 kcal) as compared to illiterate heads (975.2 kcal). However, there is no statistically significant association between household education level and available dietary energy.

Table 5.8 Education Level and Dietary Energy Available

Education level	Frequency	Average available dietary energy in calories
Illiterate	44	975.2
Read and Write	33	1063.7
Literate	23	746.9
Chi-Square	**6.620**	
Df	**2**	
Sig.	**0 .037**	

Source: Field Survey, 2010

It was also attempted to compare the mean per capita dietary energy with age of household heads. With regard to age of the household heads, the result shows, as the age of household head increases available dietary energy also increases. But for elder households especially more than 70 years, the available dietary energy has declined. Degefa (2002), in his study, argues that the

higher the age of the household head, the more staple the food security situation of the household. This is due to the fact that, older people have more options for making food available from agricultural and non-agricultural activities and also have richer experiences of the social and physical environments to enhance household food availability.

The survey shows that, household headed by 30-39 and 40-49 years have available dietary energy of 794.5 kcal and 917.3 kcal, respectively (Table 5.9). Similarly, households headed by 50-59 and 60-69 years get highest available dietary energy, 997.9 kcal and 1095.4 kcal respectively. This could be due to the fact that, household heads in this age group are expected to have better efficiency to support food grains obtained from own production. On the other hand, households headed by person greater than 70 years get lower dietary energy, 516.8 kcal. This is due to the fact that, household's heads in this age group are likely to be inactive to operate with their farm plots. Hence, sharecropped out their farm to other farmers or distributed to their married son. Even they are not likely to be active workers to engage in other nonfarm activities to support food grains obtained from their farm plot. The Pearson chi-square test also shows strong statistical association between age of household head and household food availability. Hence, age of household head determine the available dietary energy of a given household.

Table 5.9 Age and dietary energy available

Age of household head	Average available dietary energy in calories
>30	476.3
30-39	794.5
40-49	917.3
50-59	997.9
60-69	1095.4
≥ 70	516.8
Chi-Square	**39.920**
Df	**5**
Sig.	**0.000**

Source: Field survey, 2011

Household size has also its own influence on food security status of households. Family size affects household food consumption with regard to the number of consumers. This is, because, large family size exerts more pressure on household food consumption and cause the available dietary energy of household to decrease. However, some household perceived as, household who

has large family size (children) is considered to be rich in a society and can deploy more labor power in agricultural and nonagricultural activities. Hence, large household size is perceived as a source of income which, in turn, would increase household food availability. The survey result also confirms this reality. Households with size of 10-12 get relatively larger amount of per capita dietary energy, 1242.4 Kcal whereas households both with 2-5 and 6-9 household size get lower per capita dietary energy, 831.2 and 1050.8 respectively. This shows that, as the number of household size increases the availability of dietary energy increase so positively related with household available dietary energy. As shown in Table 5.10, the association between household size and food availability of the household is statistically significant. Hence, household size affects the available dietary energy of a given household. This might be due to higher labor productivity in the household or other related factors which need further investigation.

Table 5.10 Household size and dietary energy available

Household size	Average available dietary energy in calories
2-5	831.2
6-9	1050.8
10-12	1242.4
Chi-Square	**31.040**
Df	**2**
Sig.	**0.000**

Source: Field survey, 2011

5.5.2 Productive Resources

The discussion in chapter 4 generally indicates that, the level of household assets ownership is essential to enhance household food availability. Therefore, access to farm land, farm holding size, fertility status of farmland, farm oxen, livestock size, access to credit, off-farm income opportunities are determined the dietary energy of households as well. The Pearson chi-square test (Table 5.11) also shows the strong statistical association between access to productive resources such as farmland, farm oxen, livestock owned, farm input utilized ($p<0.001$). However, access to irrigation services, does not show any statistically significant association with household food security status ($p>0.05$). This shows, whether access to irrigation or not, does not have effect on household food availability. Furthermore, the chi-square test shows significant association between household engaged in off-farm activities and available dietary energy of the household, thus, determine household food availability.

Table 5.11 Access to productive resources and dietary energy available in calories for households owing asset and without

Access to Productive resources	Average available dietary energy in calories		Pearson Chi-Square	df	Sig.
	Yes	No			
Farmland	959.5	579.3	92.2	1	0.000
Farm oxen	1076.7	686.7	12.9	1	0.000
Livestock owned	1001.9	547.4	84.6	1	0.000
Farm input utilized	982.3	548.9	73.9	1	0.000
Access to irrigation	1010.4	911.3	3.2	1	0.072
Credit services	943.0	995.4	43.6	1	0.000
Off farm activities	955.9	944.2	10.2	1	0.001

Source: Field survey, 2011

Farm oxen serve as a source of draught power in many developing countries. Thus, affect household food crop production directly. The basic argument here is that, households who have access to farm oxen achieved their agricultural operations timely and increase food production and available dietary energy of household. As it is observed from Table 5.12, the gap between available dietary energy of sampled households' that possess one ox and four farm oxen is wide. Moreover, there is strong statistical association between the number of farm oxen owned and available dietary energy of the household.

Table 5.12 Number of farm oxen owned and dietary energy available

Number of farm oxen	Average available dietary energy in calories
No oxen	686.7
One	827.7
Two	991.6
Three	1387.7
Four	1623.6
Chi-Square	**51.1**
Df	**4**
Sig.	**0.000**

Source: Field survey, 2011

Any farm input that enhances agricultural production and productivity would be expected to boost the overall farm production and contributes towards attaining household food security (Degefa, 2002). Literatures on roles of fertilizer in agricultural productivity found that, fertilization of farmland can boost agricultural production and influences the food security status

of a household (Kidane et al, 2005). Chemical fertilizer and improved seeds are used to increase crop production and thereby minimize the risk of food shortage among households. Hence, the use of farm input such as fertilizer and improved seeds have an adverse impact on household food security.

The types of input utilized have significant impact on household food security hence determine household food availability. The chi-square test shows significant association between types of farm input utilized and the average dietary energy available ($P<0.01$). However, inappropriate utilization of modern farm inputs among households causes food production to decline. The result shows that, available dietary energy of household who use only improved seeds and fertilizer are 901.8 kcal (Table 5.13). This may not be due to limited role of these inputs to enhance farm production and increase available dietary energy but, due to inappropriate utilization of inputs among households. So that, the types and amount of input utilized is directly related to household food availability and determine dietary energy of the households.

Table 5.13 Types of farm input utilized and average dietary energy available

Types of input utilized	Frequency	Available dietary energy in calories
Fertilizer only	15	936.7
Fertilizer and improved seeds only	21	901.8
Fertilizer and herbicides only	24	990.8
Fertilizer, improved seeds and herbicides	29	1064.1
Fertilizer, improved seed, herbicides and pesticides	4	878.9
Chi-Square	**19.849**	
Df	**4**	
Sig.	**0.001**	

Source: Field survey, 2011

With regard to farm holding size, like other productive resource, it directly affects food availability of the households. Sufficient farmland size for crop and livestock production affects food security status of households positively. Even though, the qualitative result shows a significant role of farmland productivity than farm size, large farm size enables to increase agricultural production and productivity. The basic premise here is that, availability of relatively large farm size, regardless of its productivity, has an advantage to enhance agricultural and non agricultural productivity. This, in turn, would increase household food availability. Therefore, under subsistence agriculture, farm holding size is a means of ensuring household entitlement to

food and plays a significant role in influencing availability of adequate dietary energy. As indicated in Table 5.14 there is strong statistical association between farm size and available dietary energy of household. Hence, though it needs further investigation, large farm size with other related factors increase available dietary energy of the household.

Table 5.14 Size of farm landholding and average dietary energy available in calories

Size of farmland	Frequency	Average available dietary energy in calories
No farmland	2	579.3
0.25-1	24	730.1
1.25-2	40	861.4
2.25-3	29	1107.6
3.25-4	4	1946.2
>4	1	2150.9
Chi-Square	**82.280**	
Df	**5**	
Sig.	**0.000**	

Source: Field survey, 2011

The fertility status of farmland affects availability of dietary energy of household. Poor soil fertility reduces food production while fertile land results in greater food production and results in adequate food availability. The survey result shows that, household with poor soil fertility has available dietary energy of 731.6 kcal while with moderate soil fertility obtains 1463.5 kcal. Because, fertile farm land enable household to boost agricultural production and increase available dietary energy. The Pearson chi-square test also shows strong statistical association between fertility status of farmland and available dietary energy of the household. This indicates that, fertility status of farmland owned is one of the determinants of household food security situation.

Table 5.15 Fertility status of farmland and dietary energy available in calories

Fertility status	Average available dietary energy in calories
Poor	731.6
Moderate	1463.5
Good /fertile	2322.8
Chi-Square	**74.224**
Df	**2**
Sig.	**0.000**

Source: Field survey, 2011

Chapter 6 : Perception, Causes and Coping Strategies to Household Food Insecurity

In this study, the food security situation of the community under study has been assessed by data gathered through various techniques. Surveys has been conducted to estimate the net available food grain and per capital dietary energy in calories for consumption in the households. The result obtained from the analysis indicates the low availability of dietary energy of households from food grains.

It is believed that qualitative data obtained through various methods such as focus group discussion, key informant interview and field observation should support the quantitatively generated data. Hence, in addition to quantitative result, people's own experiences, perceptions and feelings of the level of their household food security have been considered to explore whether or not households are self sufficient; whether or not households were food secure depending on their self-assessment; the main factors that are perceived to be responsible for household food security problem, and households coping mechanism to food insecurity are discussed in this section.

6.1 Perception on Household Food Security Situation

Food self-sufficiency and food security are two concepts having different meanings. Food self-sufficiency refers to the ability of households to cover its household consumption from own crop and livestock production. In the context of subsistence farmers', food self-sufficiency (*bemigib rasun yechale*) entails whether the crops and livestock produced at home can cover their annual food consumption requirements or not. It generally deals with availability of food supply while food security apart from food availability addresses the issues of access, utilization, security and variability. It is not an issue of whether they can produce sufficient amount or not, but access to food requirements'. Therefore, households can produce, purchase from the market, or obtain food or cash in the form of transfer in order to sustain their household food security (Degefa, 2005).

In the discussions made with key informants and elderly people in the study area, food security is understood as a basic need and a key for livelihood. They stated that, unless they command over sufficient amount of food with quality they need, it is difficult to plan for creating asset such as

building house, livestock, and wealth accumulation. During the survey, the households were asked about whether they are food secure or not? Accordingly, 69 percent of households perceived as they are food insecure. As the survey result indicates, they use different techniques to cover their food needs mainly purchasing food from markets, borrowing and receiving relief foods. Households were also asked whether they afford to purchase food from market. Surprisingly enough, almost all of respondent households respond that, they afford to purchase food grains from market. KI3 noted that, *"in order to live on this earth we need to have foods for eating, which is a culturally accepted food. So, to have access to such food item we sell out what we have in our home such as small animals, firewood, kubet, grass especially wet grass (which is locally called, mujja) and if the case is serious we sell out our farm oxen".* Hence, what people consume at home depends primarily on their economic capacity to afford food stuffs, and also on cultural preferences.

It is also understood from the respondents that, food security problem have deep-rooted in the area from year to year due to various problems such as erratic rainfall distribution, poor soil fertility, soil erosion, crop pest and disease prevailed in the area. Due to these factors, agricultural production and productivity have declined overtime. Consequently, most farmers have failed to cover their annual food requirements from own production. KI3 indicates that, *previously it is humiliated farmers to buy food grain such as teff from market especially in July and August because they consider themselves as non self sufficient. But currently the case has shifted. Farmers' compete with urban dwellers and some households in which their livelihood depend on off-farm activities to purchase food item in the season aforementioned.*

Though most of the farmers are experienced food shortage every year, there is a difference in duration for which households have exposed to the problem. Results of the study show that, 47 percent of households face food shortage in the year under study. Among these households, 83 percent face food shortage for about three months (August, September and November) whereas 13 percent of the households face food shortage for about six months (May to November). The remaining 4 percent face food shortage for relatively long period of time, about nine months (March to November), almost a year.

Table 6.1 Duration of food shortage in the sampled households

Duration	Frequency	Percent
Nine Months (March-November)	6	12.8
Six Months (May-November)	2	4.3
Three Months (August-November)	39	83.0
Total	47	100.0

Source: Field survey, 2011

Regarding food meals prepared in the household, almost all households respond that *injera* and *wat* are frequently prepared and consumed in the households. Change and continuity in type of staple foods and meals that are most often prepared and consumed by people to a certain extent tell about their current food consumption situation and their level of food security; because under normal condition households preferred to stick to their typical food (Degefa, 2005).

The result of the study as shown in Table 6.2 confirms that the majority of the households rely on *injera* and *wat* frequently; while other types of food stuffs such as livestock products, fruits and vegetables are consumed rarely. Besides, the researcher has also discussed with the participants of FGD and key informants about the food type households in the study area eat frequently. In this case, all the participants and discussants indicated that, *injera* with *wat* or *biddena ittoon* (Afan Oromo) is the most common food type eaten in all homes. The probable difference is the type of *ittoo (wat)* they use to eat *biddena (injera)*. The type of *wat* a household often consumes at home is determined by the household's economic status. Hence, *shirro* and *kik* are the cheapest and the affordable type of *wat* for most households (Degefa, 2005). A significant change is observed in relation to the ingredients of *wat* making in the area. Apart from meat and vegetables, at earlier time even *shiro wat* was made from bean and pea by putting some butter on it, onion, pepper and salt. However, nowadays the ingredient of *shiro wat* has changed to vetch, oil, onion, pepper and salt. This significant change shows that, butter has been completely replaced by edible oil purchased on the market and bean and peas are replaced by vetch. It is common practice that people sell their butter and buy edible oil. Regarding change in types of *wat* used to consume *injera,* one key informant in Girar Geber *kebele* says "*dokkee adiinu nutti arare*" (Afan Oromo) which is literally mean; we face difficulty of getting a poor quality shiro *wat (nech shiro)*. In

addition, food such as porridge, bread, *suummo (nifro), akaayii (qollo)* and other cultural food are eaten as a supplementary food with limited frequency in the study area.

Table 6.2 Types of food meals prepared and consumed in the household

Types of food stuffs	Frequently		Sometimes		Rarely		Not at all	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Biddena	100	100.0	-	-	-	-	-	-
Bread	8	8.0	63	63.0	29	29.0	-	-
Porridge	-	-	25	25.0	75	75.0	-	-
Wat	100	100.0	-	-	-	-	-	-
Oil	84	84.0	15	15.0	1	1.0	-	-
Meat	-	-	23	23.0	70	70.0	7	7.0
Chicken or eggs	1	1.0	17	17.0	58	58.0	24	24.0
Milk or cheese	10	10.0	34	34.0	33	33.0	23	23.0
Butter	8	8.0	34	34.0	37	37.0	21	21.0
Potatoes	6	6.0	59	59.0	35	35.0	-	-
Vegetables	6	6.0	61	61.0	33	33.0	-	-
Fruits	-	-	20	20.0	32	32.0	48	48.0

Source: Field survey, 2011

The type of meal that is consumed in any rural households largely depends on the economic status and cultural preferences of people. Regarding to change in types of food meals consumed in the household, FGD6 indicates that "*Even if we want to change our food meals, our children could not accept it and they consider as lack of food*". Accordingly, the researcher remembers one surprising word the participants have raised on what children have thought "*tinant ihil aten dabbo belten adderin*" (Amharic) which is literally mean, last night we ate bread since we could not get other food. This shows to what extent *injera* is consciously chosen by people in the study area. The change and continuity in the type of meals that people consumes at home determine the household food security condition to some extent.

As it is mentioned earlier, foods that are acquired from livestock products such as butter, milk, eggs, and cheese are consumed rarely. Furthermore, some FGD participants and informants of in-depth interview in the study area indicated that, most households consume livestock products during religious and social ceremonies only. The low consumption of livestock products has its own impact on food utilization of the household in the study area. Regarding fruits and vegetables consumption, vegetable especially onion is frequently used in the household while other types of vegetables are consumed most often. Apart from households who produce on their farms like in *kolla kebeles,* fruits are consumed only by a limited number of households who afford to buy it. Therefore, the demand for availability of various food sources, except for cereal crops and pulses is low which, in turn, reduces dietary energy of the household in the study area. From this discussion, one can easily understand that, the food habits and the lack of nutritional knowledge results in food shortage. Hence, frequency of food intake, poor awareness on the consumption of various fruits and vegetables and inability to access livestock products signifies poor dietary intake and insecurity of food utilization in the area.

6.2 Causes of Household Food Insecurity

The causes of food insecurity are classified as demographic, bio-physical, socio-cultural and infrastructural, economic and political and institutional related constraints. Though the causes are diversified they are interrelated and believed as the root causes for another problem. They have also different magnitudes and the level of influence on agricultural production and household food availability.

6.2.1 Demographic Related Problem

Though resources like human labor are obtained from demographic dynamics, it exerts pressure on natural resource such as land, water, and the like (Hussein, 2006). In the study area, demographic factors such as shortage of farmland, land fragmentation, overgrazing, poor fallowing practice and high age dependency are considered as the main causes for lower agricultural production thereby reduces food production in the study area. Because it causes the rate of soil erosion and depletion of soil fertility to increase which is directly reduces agricultural production and productivity and results household food availability to be declined.

The survey result shows that, shortage of land among the other is the main constraint to improve agricultural production. Hence, 88 percent of households put land shortage as the primary

demographic related problem constraining household to ensure household food security. But, the multiple regression analysis shows that, land shortage is negatively correlated with household food security situation. Although the relationship between food security status of households and shortage of farm land is not statistically significant, the probability to constrain household food security is increased by 0.681 (Table 6.3). On the other hand, farmers perceive high population pressure as a cause of household food insecurity. Moreover, the multiple regression analysis result also shows the positive correlation of population pressure and household food security.

Furthermore, though labor supply is not reported as a significant constraint to agricultural production, high level of dependency on active people is perceived as causes of household food insecurity in the study area. The regression result shows that, high age dependency is positively correlated with household food security while, overgrazing is negatively correlated with household food security. Generally, though the multiple regression analysis of some demographic variables shows the negative correlation, demographic factors are the main causes for declining food availability by constraining food production and purchasing power of households.

Table 6.3 Demographic related problem constraining household food security

Problems	Category	Frequency	B	SE	Exp(B)
Land shortage	Yes	88			
	No	12	-.385	.798	.681
High Population Pressure	Yes	87			
	No	13	.786	.777	2.195
Land Fragmentation	Yes	76			
	No	24	-.782	.630	.457
Overgrazing	Yes	83			
	No	17	-.680	.743	507
Poor Fallowing Practice	Yes	66			
	No	34	.191	.657	1.211
High age dependency	Yes	63			
	No	37	.211	.696	1.235

Source: Field survey, 2011

6.2.2. Biophysical Related Problem

The role of physical factors in constraining agricultural activity is high. Unless physical resources enables production, ensuring food security is impossible in countries like Ethiopia because, agriculture which is the backbone of the country's economy cannot be practiced be it crop and livestock production or other activities (Hussein, 2006).

The major biophysical related problems identified by households are erratic rainfall distribution, recurrent drought, poor soil fertility, deforestation, soil erosion, frost attack, water logging, livestock disease prevalence, and crop pest and disease. Households respond on the degree of influences of these problems on household food production. Among this, poor soil fertility, soil erosion, deforestation and rainfall shortage are the most dominant bio-physical factors making the rank from one to four respectively in constraining food production in general and household food availability in particular. Because, this factors in one or another way affect agricultural production, and then directly decrease household food availability in the study area. Accordingly, 98 percent of samples replied poor soil fertility as the main constraints to agricultural production and directly affect household food security by influencing food availability (Table 6.4). Moreover, FGD1 indicate that, "*poor soil fertility causes us to expend extra cost to purchase farm inputs like chemical fertilizer*". Even though multiple regression result shows the negative correlation of poor soil fertility and household food security situation, the probability to affect food security is increased by 2.31 among those household who do not perceive poor soil fertility as the main constraints to household food security situation.

On the other hand, soil erosion is the cause for decline in crop production for 96 percent of households. The root causes for soil erosion is removal of natural vegetation which is deforestation. Deforestation is not only the causes of soil erosion but, causes erratic rainfall distribution and drought and increases the vulnerability of the households to low agricultural production and food insecurity. FGD4 participants indicate that, "*removal of natural vegetation causes productivity of farm land to be lost. Currently, mountainous areas are cultivated; forest lands are changed into bare land hence causes severe soil erosion*". The multiple regression result also shows the positive correlation hence, significant to affect household food security situation.

Erratic rainfall distribution is considered as the main constraints to crop and livestock production. FGD1 participants indicate that, "*Before the past 10 years, we produce crop twice a year, which is belg and meher crop production. But, currently, we cannot produce even meher crop properly due to erratic rainfall distribution*". In general though the regression result shows the negative correlation of rainfall shortage and household food security, inadequate and varying rainfall is a major bio-physical factor affecting the food security status of the area

Table 6.4 Biophysical related problem constraining household food security

Problems	Category	Frequency	B	SE	Exp(B)
Drought	Yes	80			
	No	20	-.369	.571	.691
Landslides	Yes	28			
	No	72	.384	1.114	.730
Rainfall Shortage	Yes	84			
	No	16	-.017	.591	.983
Deforestation	Yes	93			
	No	7	-.761	3.620	.467
Poor Soil Fertility	Yes	98			
	No	2	-13.989	1.024	2.310
Soil Erosion	Yes	96			
	No	4	22.358	.234	.998
Frost	Yes	63			
	No	37	.996	1.399	.476
Water Logging	Yes	43			
	No	57	-1.959	1.216	.107
Water Scarcity	Yes	86			
	No	14	-.625	1.826	.732
Highly sandy	Yes	43			
	No	57	-1.667	1.078	.122
Weeds	Yes	73			
	No	27	-2.145	1.183	.070
Pest and disease	Yes	90			
	No	10	-.264	1.081	.807

Source: Field survey, 2011

6.2.3 Socio-Cultural and Infrastructural Factors

Unless viable socio-cultural setting and facilities are established, ensuring food security within in a given community is difficult, if not possible (Hussein, 2006). This shows that, social and cultural factors available to the households affect the type and quality of products produced which, in turn, would affect the utilization of food in the household. The state of household food security is not just access to sufficient quantity of food, but also access to food that is nutritionally of adequate quality and culturally acceptable food (Maxwell and Smith, 1992).

The survey result shows that, poor educational attainment, poor health services, poor saving habit due to costly social and religious ceremonies are the main socio-cultural factors that cause effect on household food production and availability (Table 6.5). Respondent households identify poor saving practice as the main cause of household food security in the area among other socio-cultural related problems. Socio-cultural variables such as eating habit, food preference, cultural ceremonies and festivals and poor food rationing influence the food utilization of the households and way of saving and directly or indirectly affects the food access of the given community. Regarding to food preferences and eating habit unlike households live in *dega* and *wonadega* areas, sorghum *injera,* partly is more preferred in the households live in *kolla* areas though it is known for its low calorie energy in nutritional point of view. They perceive that, sorghum crop failure is the cause of household food insecurity because *teff* is considered as cash crop.

Access to infrastructure such as market center and roads promote livelihood diversification and agricultural intensification. Adequate transport facilities, especially main and feeder roads that improves access to farm input such as fertilizer, seed, pesticide, herbicides and other agricultural implements enhances agricultural production and productivity of a given community. As a result, food access and availability of a household is improved.

The multiple regression result also shows that, poor saving, inadequate veterinary services and costly social and religious ceremonies are positively and significantly correlated with household food security condition while poor food rationing, poor human health and educational attainment are negatively correlated.

Table 6.5 Socio-cultural and infrastructural related problems constraining household food security

Problems	Category	Frequency	B	SE	Exp(B)
Poor saving	Yes	95			
	No	5	5.383	3.414	.115
Poor educational attainment	Yes	72			
	No	28	-.074	2.255	.974
Poor human health services	Yes	66			
	No	34	-8.507	3.995	.033
Inadequate veterinary services	Yes	69			
	No	31	4.895	2.956	.098
Costly social and religious ceremonies	Yes	69			
	No	31	.813	2.825	.774
Poor road and communication networks	Yes	63			
	No	37	-6.659	3.587	.063
Poor food rationing	Yes	72			
	No	28	-1.927	2.543	.146

Source: Field survey, 2011

6.2.4 Economic Factors

The economic status of a household has a significant role in enabling households to access food either through production or purchase from market. The extent to which a household earns cash income matters a lot in improving agricultural activities and improve food production. It is also observed that, agricultural products make nearly all the bases of household income. Hence, productivity of agricultural production determines the cash income of the households. The limited non cash income obtained from off farm activities like petty trade, sales of crafts, credits obtained either from private money lenders or lending institutions and income obtained from casual labor wage are limited to satisfy the cash demand of household in the study area.

Apart from off farm activities, the numbers of livestock owned by the households are limited. This, in turn, would leads to poor cash income sources and causes the purchasing power of households to decline. Due to this factor, the capacity of household to purchase farm input thereby boost their food production is limited. In addition, shortage of farm holding size with limited farm oxen also contributes for reduction in agricultural production and productivity which, in turn, would reduces the household food availability.

In general, the multiple regression analysis shows that, poor cash income, limited livestock owned, low off farm activities, insufficient farmland holdings, limited application of modern farm inputs and traditional farm implements are positively correlated and significant to bottleneck agricultural production and productivity in general and household food security in particular in the study area. However, the result shows that, there is a negative correlation between shortage of farm oxen and household food security condition. Although the relationship between food security status of households and shortage of farm oxen is not statistically significant, the probability to be food insecure is increased by 0.69 among households who do not possess farm oxen.

Table 6.6 Household economy related problems constraining household food security

Problems	Category	Frequency	B	SE	Exp(B)
Poor cash income position of households	Yes	85			
	No	15	1.562	2.825	4.770
Limited livestock number owned	Yes	54			
	No	46	1.771	1.795	5.874
Low non-farm income	Yes	90			
	No	10	3.163	1.794	23.634
Shortage of farm oxen	Yes	72			
	No	28	-2.674	2.488	.069
Traditional farm implements	Yes	64			
	No	36	.391	2.448	1.478
Lack of access to appropriate technology	Yes	81			
	No	19	.182	.789	1.200

Source: Field survey, 2011

6.2.5 Political and Institutional Related Problem

Political and Institutional related problem that are identified by the households are weak extension services, weak rural organization and weak market for output. These factors have caused agricultural production to decline hence, affect food availability.

As substantiated by FGD participants, the current development strategies put high value and expect a lot from farmers to change the poverty situation of the country. The government promises to support subsistent famers to augment their productivity. But, practically, little has been done. Improved technologies such as modern farm inputs are not accessible by all farmers

due to its high price. Regarding extension services, most samples raised lack of farm credit as the main constraints to enhance agricultural production and productivity of subsistence farmers in the area. In addition, the support given to livestock production through provision of improved livestock breed and lack of adequate veterinary services is almost poor in the communities understudy. Hence, access to extension services for crop and livestock production is inadequate to produce adequate food for the household in the study area.

Regarding the rural organizations, the attempts made to strengthen social ties; assist the farmers' knowledge, skill and information transfer; input provision and self help at times of production shortfalls and economical burden are expressed by the respondent to be poor. Respondents expressed that, rural organizations like farmers service cooperatives are not well organized and even the organized one are not functional in the areas. Other community organizations like *iddir*, *ikub*, *mahiber* and various labor organizations are described as weak and little benefits have been obtained from them, particularly, in terms of social support. Hence, People participate in some of these organizations for sake of membership only.

Moreover, weak market for output is identified as the policy related problems in the area. The price of output sold and input purchased are not equal. On the other hand, to buy basic goods and services in the household, huge amount of products produced needs to be sold. Hence, the amount of food grain left in the home is not sufficient to cover annual food consumption and thereby reduces food availability in the household.

6.3 Household Coping Strategies to Food Shortage

This section tries to analyze the main household coping strategies to food shortage. Food insecure household in the study area develops their own mechanism of coping strategies to household food shortage. The survey results and discussion made with focus group discussion and informants shows that households in the area have been responding to the problem of food insecurity. Though there are minor variations among households, the response of most of the household life is based on production, market, consumption and transfer based mechanism. Likewise, households were asked to identify their coping mechanism while they face food shortage. This include changing cropping pattern, migrating to nearby town, eating less preferred foods, selling grass and firewood, selling out small animals, skipping adults to feed children, engaging in petty trade, sell off farm oxen and leasing out land. Hence, the main coping mechanisms adopted by

household in the study areas are used to increase household food availability through production, purchasing and reducing household consumption.

Changing cropping pattern, which implies growing drought tolerant crops and relying on relief food are adopted to increase household food availability while income generating ventures such as selling grass and firewood, sell off small animals, borrowing cash from private money lenders, migrating to nearby town for casual laborers, engaging in petty trade, sell off farm oxen and leasing out land are used to purchase food from markets. Regarding reducing household food consumption related mechanism, reducing consumption during each meal, reducing the number of meals per day, eating less preferred food such as maize, sorghum especially "*Mariam Zer* ", vetch , cabbage, and the like, and skipping meals for adults to feed children are the major ones.

The survey result shows that, among the coping mechanisms, changing cropping pattern and selling small animals are practiced by the largest proportion of households, which is 98 percent and 84 percent respectively. Contrary to this, migrating to nearby town, sell off farm oxen and leasing out farmland are practiced by small proportion, which takes 6 percent, 16 percent and 18 percent respectively (Table 6.7).

Table 6.7 Major coping mechanism to food insecurity in the households

Coping mechanism	Frequency	Percent
Changing cropping pattern	98	98.0
Migrating to nearby town for wage labor	6	6.0
Consuming less preferred food	43	43.0
Borrowing grains from relatives	58	58.0
Borrowing grains or cash from money lenders	45	45.0
Selling off small animals	84	84.0
Selling grass and firewood	52	52.0
Rely on relief grains	30	30.0
Sell off farm oxen	16	16.0
Leasing out land	18	18.0
Engaging in petty trade	59	59.0

Source: Field survey, 2011

Chapter 7 : Summary, Conclusions and Recommendations

7.1 Summary

Households of the study area primarily depend on mixed farming, crop production and livestock raising. However, due to differences in agro-ecology the type of crop grown and the importance attached to these crops differs considerably. There are also differences in terms of the size of land under each crop grown. Therefore, wheat, barley, and *teff* are the primarily crops for households in *dega* and *woinadega* area while *teff,* sorghum and maize are the main crops in *kolla* areas. There is also a difference in the living conditions due to differences in agro-ecology. The livelihood means are often prone to crises in kolla areas as compared to *dega* and *woindega* areas.

Low agricultural production and productivity is the underlying causes of household food insecurity in the study area. According to the majority of respondents, the major constraints that hinder crop productivity are bio-physical related factors (drought, poor soil fertility, soil erosion, erratic rainfall distribution, poor land management practices) and poor access to livelihood assets (lack of access to farm oxen, poor access to farmland, low application of farm inputs and financial constraint).

In addition to crop production livestock raising plays an important role in sustaining the livelihood of rural households. Apart from serving as food source and cash income, livestock support crop produce through the supply of draft power and also inputs such as dung, which is used to maintain soil fertility. Livestock raised in the area are cattle, equines, chicken, sheep and goat, and honey bees. However, income obtained from livestock and livestock products is limited. Shortage of water, grazing land and high prevalence of disease outbreaks are the most serious bottlenecks challenging households to produce quality and reasonable size of livestock, and thereby to get good production from this sector.

Employment in off-farm and non-farm activities is essential for diversification of the sources of farm households' livelihoods. It enables households to enhance their income, gives a chance to purchase necessary inputs thereby modernize means of production, and reduces the risk of food shortage during periods of crop failures through food purchased.

The major rural organizations in the study area include community based organization such as farmers' service cooperatives, *iddir, ikub* and community labor organizations including *jigi/debo* and *wenfel*. However, according to household responses, the benefits expected from such organizations are limited. Even they participate for sake of membership.

The problem of smaller landholding size is associated with large family size and the growth of population that exerts more pressure on the resources causing the shortage and scarcity of cultivable land. Beside, the gradual loss of land productivity particularly depletion of soil fertility and hence the low yield and low productivity of agricultural production aggravate the problem of household food insecurity. The main causes for the loss of soil fertility are over cultivation and overgrazing of agricultural lands. Moreover, the lack of farmland management practices is the main reasons for low yield and inadequate production.

Among the studied households, 85 percent are food non-self sufficient. As the survey result shows, non-self sufficient households in the area can cover their household's food demand through purchasing from market, borrowing from relatives or friends and rely on relief food in some cases. Although all categories of sampled households are affecting by food insecurity, the problem is serious especially for households with poor access to productive resource. Moreover, 69 percent of respondents perceived themselves as food secure. However, the survey result shows that, 84 percent of household obtain the available dietary energy lower than 33 percent of MRA, and possible to say that 84 of samples are severely food insecure.

The main coping mechanisms adopted by the household in the study area are used to increase household food availability through various means such as production, purchasing and reducing household food consumption. Households increase household food availability by changing cropping pattern while income generating ventures such as selling of fire wood, sell of small ruminant and the like are used to purchase food in the market. Likewise, reducing consumption during each meal, reducing number of meal and eating less preferred foods are used to reduce household food consumption thereby increase household food availability.

To sum up, the problem in various aspects, from natural to social and political, made th e household food security situation in Girar Jarso *woreda* worse.

7.2 Conclusions

The study revealed that, the status of household food security is determined mainly by access to productive resources/asset that is required to produce and generate income. Availability of productive resources such as adequate fertile land, grazing land, farm oxen, the number and type of livestock owned, access to off-farm sources of income significantly determine the household food security. Households that have no adequate amount of these resources might not have the means and ability to produce enough food/or to generate adequate income. Thus, households who do not have the capacity to command adequate amount of productive resources and/or who have no options to generate income are severely food insecure.

It has been pointed out in the discussions that, a great proportion of the households in the study area are food insecure due to poor access to resources to produce and purchase adequate amount of food grains. Farmers perceived that, the causes of household food insecurity of the *woreda* are caused by agricultural production and productivity related problems, including crop and livestock production. Accordingly, poor access to productive resources, weak socio-cultural and infrastructural network and inefficient policies and institution such as insufficient farm holding, poor cash income, poor soil fertility, poor saving, and weak rural organization and extension services are identified as the underlying causes of the problem.

Regarding to family size, the quantitative result shows that, households with large family size obtain higher available dietary energy than with small family size. The basic argument here is that, availability of a relatively large labor force, regardless of farm size, can be an advantage to those households who struggle to achieve household food security. In subsistence farming, households with large labor supplies are in a better position to increase the productivity of their land. On the other hand, excess labor force is engaged in other income generating activities such as casual wage labor, petty trading and the like. For instance, children have obtained income through the so called *kira*, which is a system of casual wage labor arrangement in which individuals work for the better income sources. As a result, large family size is used to diversify source of income and considered as a source of power of households to access available food either through production or purchase. However, the qualitative result shows population pressure as the major causes of household food insecurity. This is due to the fact that, large population

pressure exerts more pressure on access to productive resources such as land and which, in turn, would lead households to food insecurity.

The finding of the research also indicates that, per capita dietary energy is significantly influenced by the activities in which members of the household are engaged. Households with various income sources have a chance to improve household food consumption and are less susceptible to food insecurity. As it is indicated in the study, large proportion of households are non-self sufficient in food and forced to diversify sources of incomes. Households diversify their incomes by selling firewood, grass, *kubet*, eucalyptus trees, crafts, and working on farms as daily laborers. The absence of off-farm income opportunities has led to increasing asset depletion and growing levels of household food insecurity.

It is also observed in the discussion that, households cope with seasonal food shortage. The main coping mechanisms are used to increase household food availability through production, purchase and reducing household food consumption mostly, by eating less preferred foods. To this end, "*mariam zer*" is responded by the majority of household as the main source of food.

In general, bio-physical related problems such as erratic rainfall distribution, recurrent drought, poor soil fertility, deforestation, and pest and disease infestation are the main constraints to crop production, and thereby leading household to decline in food availability and increase household vulnerability to food insecurity. Moreover, poor access to productive resources such farm land, farm oxen, livestock possession, access to credit services and off-farm income opportunity have a key role to enhance household food security. Thus, limited access constrains household food availability and purchasing power, which, in turn would aggravate the problem of food insecurity. Regarding household food utilization, poor water supply and sanitation, poor food rationing and saving habit exacerbate household food insecurity.

7.2 Recommendations

Based on the findings of the study the following issues are forwarded as recommendation to improve household food security situation of Girar Jarso *woreda.* The root causes of sever food shortage in the area is related to entitlement failure resulting from poor asset position of the household. Hence, the following are some of the suggestive remarks to improve household food security situation of the studied household.

- In order to increase household food availability, increasing agricultural production and productivity is the main factor. Hence,
  - Introducing high yielding improved crop varieties, improving method of cultivation, promoting small scale irrigation and improving the livestock production should be taken into consideration by agricultural office at different level (Oromiya, Zone, and *Woreda*), and households themselves.
  - Integrating crop production and livestock rearing offers better advantage in order to sustain their livelihoods and improve household food security condition.
  - Increasing off-farm activities such as petty trade, handicrafts and the like are used to diversify the sources of income and increase household food availability.
  - Diversifying farm activities, beside annual crop production where potential exists such as focusing on perennial crops, vegetables and fruit through small scale irrigation.

- Food utilization is improved through change in household consumption pattern including eating habits and food preferences, culturally accepted food types which, in turn, would stabilize household food availability. In addition, access to clean water supply, sanitation and health services play a role to improve household food utilization. Hence, the household themselves and government body should take this action into account.

- Projects such as productive safety nets, food for work and cash for work play an integral part in household food security improvement. Hence, In order to enhance food access either through production and market based the *wereda* needs to be supported by these projects.

- The topography of *kolla kebele* is mountainous, hill and sloppy to steep sloppy. In this area, both excess and scarcity of rainfall causes crop failure. Hence, rely on food aid/relief. To improve their livelihoods and food security in the long run, rather than providing relief food for short term assistance, voluntary resettlement scheme to other potential area may be the most prominent option. Hence, government should take this action into consideration.

- Improved land management practices, afforestation, and soil conservation are important in the rehabilitation of the natural resource base and ensure the sustainability of agricultural production and productivity in the long-run which, in turn, would increase household food availability. Hence, concerned GOs and NGOs should increase investment on environmental rehabilitation and conservation. Moreover, the community by itself needs to be mobilized and aware on existing natural resource management practices at all.

- Finally, due to low resources and some inconsistency, the study was conducting by taking small sample into account. Hence, it is difficult to generalize the household food security situation in the study area. As a result, conducting similar research with large sample can be invited to understand household food security situation in Girar Jarso *woreda* adequately.

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Annexes I

A. Checklist for Field Observation

1. **Environment**
    1. Relief (plain, plateau, mountain, steep slopes)
    2. Land-use and land cover
    3. Soil aspects
    4. Water bodies
2. **Population**
    1. Settlement patterns
    2. Ethnicity
    3. Religion
    4. Culture, value, traditions
    5. Social relations neighbourhood, network, reciprocity
3. **Economy/Sources of livelihood**
    1. Main source of livelihood: mixed farming, non-farm activities
    2. Crop types: dominant in terms of area cultivated and size of harvest during *meher* and *belg* seasons, source of staple food
    3. Livestock: type, size, raising practices
    4. Situations of social and economic infrastructure: transport, water, health, marketing, extension services, sources of water supply, schools, health posts.

B. Check List for Focus Group Discussions

1. Perception towards land resource change: vegetation, soils, water use and distribution.
2. Perception towards population increase (having large family size) and its advantage and disadvantage.
3. Do you observe any households who cannot cover its food need? If so, how they used to bridge the food gap?
4. Average number of months most households able to feed themselves from their own production.
5. Do you observe any individuals or group of landless people in your *kebele*? If there are, please explain how they generate their livelihoods.
6. How do you judge the fertility level of the farm land as compared to the situation some 5 years ago?
7. Please describe the trends of rainfall performance in the last 10 years and its implication for agricultural performance,
8. What are the main constraints to produce crops and raise livestock?
9. Availability of health, school, credit, water supply, market, agricultural extension and irrigation services and facilities.
10. What are the survival strategies used by people in the area to cope with food stress?

C. Checklists for Individual Interview Guides

1. Key informants – community elderly

- Demography: age, household composition, etc.
- Migration: birth place, stay at other place, and stay at current site
- History of the area: landscape, settlement density and patterns
- Perception towards population increase, having large family size
- Perception towards diminishing land size
- Land resource change: vegetation, soils, water use and distribution
- Land holdings at main site: for crop cultivation and grazing situation of communal land at all sites?
- Crop production: type of crop and size of harvest (2001 and 2001/02 E.C)
- Livestock possession: size and type
- Change in type of staple foods and foodstuffs
- Perception towards food shortage
- For how long does the harvest at home cover household food requirements?
- Grain purchase: during which period of a year? How much and what types per week?
- Source of cash income: sell off livestock or their products
- Is there a time of a year when your household is unable to purchase sufficient food?
- How do you survive shortage seasons (coping strategies)?
- Experience of drought: Do you remember a drought year that seriously affected your livestock and households? What happened to your livestock? How did you recover from the crises?
- What are the main constraints to raising livestock and crop production at your sites?
- Perception towards DAs and government extension packages to ensure household food security

2. In-depth interview guide for the case study peasant households

Demography and life history narratives for the head and other household members:

a. Conditions of human capital

- Name, age
- Family size by sex
- Experience and perception towards large family size
- Place of birth, migration, marriage, and mortality history
- Labor demand and supply (who can work and who cannot among the members)
- Literacy and participation in formal education
- Main health problems in the community
- Health problems experienced by household members
- Are there any disable persons among the household members?

b. Access to natural capital

- Land holding size
- Ways of getting access to land
- Sharecropping in/out
- Change in holding size over the last few years
- Perceived status of farmland in terms suitability for farming and soil fertility
- Main problems of farmland
- Land management practices
- Access to water for human and livestock use
- Problems of water use
- Access to natural vegetation
- How to use, and perception towards their removal/depletion
- Problems in relation to the exploitation of natural vegetation
- Perception towards the recurrent drought and erratic rainfall distribution

c. Financial capital

- Main annual crops grown and size of harvests during the last two years
- Trends in production (increase/decrease/no change – why)
- Perennial crops grown (size and income from their sale per year)
- Types of technological inputs under use
- Livestock owned (types and size)
- Constraints to livestock raising
- Non-farm activities that the head and other members undertake
- Income from non-farm activities and purposes for which the money is used
- Reserve money (in cash)
- Main expenditures (tax, purchase consumer items, contributions for formal and non-formal institutions)
- Housing situation , home utensils, Possessions of farm equipment and other assets

d. Social capital (social relations and networking)

- Participation in informal institutions (CBOs – *hiqub*, *iddir*, *mahiber*,neighbourhood coffee drinking)
- Participation in labor organizations
- Labor support from neighbours, relatives
- Support in kind from kin/relatives
- Draft power assistance to/from neighbours
- Grain and Cash loan during deficit period
- Remittance from/to individuals/institutions

e. Physical capital (availability and access to rural infrastructure)

- Health service
- School
- Potable water source
- Credit

- Irrigation
- Market and fair price (for both selling and purchasing)
- Technological inputs (fertilizers, herbicides, insecticides, etc.)
- Agricultural extension
- Veterinary service
- Access and affordability of medicines for human and livestock use

f. Food security

- Main staple food crops of the households
- The type of meal eaten most frequent at home
- Average number of months you able to feed your households from own production
- What are the main bottlenecks to produce crops and raise stocks that enable you to be self-sufficient in food?
- Does the income you earn from non-farm activities allow you to buy food during shortages?
- How do you cope with shortage?
- What are your survival strategies?
- Are there less preferred famine foods that are consumed by your household during food shortages

D. Checklist for Girar Jarso *Woreda* Disaster Risk Management and Agriculture Office Head

I. Physical environment

1. Area of the *woreda* in ha or km^2
2. Agro-climate(type, distribution and proportion)
3. Land use and cover(type and distribution)
4. Vegetation cover: types, density, deforestation, etc
5. Soil types, distribution, degradation/erosion, leaching, salinization)
6. Rainfall: amount, distribution and variability and the impact in their point of view).
7. Number of rural *kebeles*

II. People and culture

1. Population size
2. Ethnic composition and their relationships
3. Religion
4. Main staple foods
5. Migration patterns

III. Economy and livestock's

1. Main occupations
2. Livestock raising: types, population
3. Main field crops and perennial crops: cultivated lands, production time series data
4. Constraints to production- risk failure

IV. **Food security**

1. Food availability/sufficiency: surplus or deficit *kebele*?
2. If there has been deficit, why? Since when? Trends over time: increase or decrease.
3. Access/entitlement failure: production failure (sources of risk), purchasing failure (insufficient or no income), lack of access to transfers and inability to gather from common resource areas.
4. Which areas of the *wereda* are most vulnerable to food insecurity? *Kebeles*/areas with severe, moderate, less, or not affected by the problem of food shortage? Are there any factors that explain this spatial variation?
5. Which period in the year? Permanent or seasonal food insecurity?
6. For how long does the harvest at home cover household food requirements?
7. What are the main bottlenecks to produce crops and raise stocks that enable households to be self-sufficient in food?
8. Are there less preferred famine foods that are consumed by your household during food shortages?
9. What are peoples coping mechanisms?
10. NGO interventions in curbing food insecurity: development activities (protection), mitigating the problem, and relief (during severe problem).

E. Checklist for the Discussion with *Kebele* Administrators

1. *Kebele* administrators' perspective on food availability, access, vulnerability, and temporal variation:
    a. Is food supply for most households adequate/are households self-sufficient? If not, why?
    b. What are the causes of Production failure
    c. Can people produce sufficient food?
    d. Who supplement food by purchasing? What are the sources of income? Sale of livestock, other non farm income?
    e. Who relies up on community resources to supplement their means of subsistence? Are there the segments of population who rely up on safety nets and remittances?
    f. Who are most vulnerable to food insecurity? Why?
    g. Are the food shortages that people encounter temporal or permanent?
    h. What types of households face food shortages on a permanent base? Who is temporarily food insecure?
    i. Which areas of the *kebele* are most vulnerable to food insecurity? Are there any factors that explain this spatial variation?
    j. What are the people's main coping mechanisms? Which of these mechanisms seem sustainable and/or viable?
2. Differentiation according to wealth: do you perceive any inequality among community members? How do you categorize the people according to their wealth?

F. Checklist for observations of data from kebele and DAs records

I. Environment

1. Area
2. Relief (plain, plateau, mountain, cliff and steep slopes)
3. Agro-climate
4. Land-use and land cover
5. Soil aspects
6. Water bodies

II. Population

1. Population size
2. Settlement patterns
3. Ethnicity
4. Religion
5. Culture, value, traditions
6. Mobility and migration
7. Social relations neighborhood, network, reciprocity

III. Main agricultural extension services available:

1. Crops
2. Livestock
3. Resource management
4. Water development
5. Beekeeping and horticulture

IV. Economy/Sources of livelihood

1. Main source of livelihood: mixed farming, non-farm activities,
2. Crop types: dominant in terms of area cultivated and size of harvest during *belg* and *meher* seasons
3. source of staple food
4. Livestock: type, size, raising practices (common and unique features)
5. Non-farm/off-farm activities: availability, options and constraints
6. Social and economic infrastructure: transport, water, health, marketing, extension services.

V. Major problems of farmers in the community with regard to:

- Crop production
- Livestock raising
- Non-farm income-generating venture

VI. Food security/situation

1. Is the food produced by the farmers adequate to cover their annual consumption requirement? If not, why not?

2. If they are unable to produce sufficient amount at home, can they purchase from local markets?
3. Status of households in community in terms of access to resources: secure/insecure. If insecure, why?
4. Causes of production failure
5. Purchasing power (income constraints: no possession of livestock, lack of access to off-farm and non-farm activities).
6. Unable to get transfers, remittances, aid, or to gather from communal resources
7. The temporal variations in food insecurity: permanent/seasonal
8. What types of households are most vulnerable to food insecurity?
9. What are the people's main coping mechanisms? Which of these mechanisms seem sustainable and/or viable?
10. Differentiation of households according to well-being status (rank): strata/category, criteria for differentiation, proportion of each category to the total number of community member.

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G. Questionnaire for Structured Household Survey

I. General information

1. Agro-ecology: (Dega_____, Woinadega_____ Kolla_____)
2. Zone: _____ Woreda:_____ Kebele Name_____
3. Household Identification Number: _____
4. Name of household head: _____
5. Date of Interview: _____
6. Time of interview: Starting time: _____, Finishing time: _____

II. Household Demographic Characteristics

1. Sex of household head: a) Male b) Female
2. Age:_____
3. Marital status: a) Single b) Married
   c) Divorced / widowed d) Separated e) Others, specify
4. Educational Status:
   a) Illiterate b) Read and write c) Church school d) Other, specify
5. Ethnicity: a) Oromo b) Amhara c) Other, specify
6. Religion: a) Christian b) Muslim c) Other, specify
7. Number of permanent household including household head at time of survey
   (Male_____ Female _____Total _____)

III. Access to Physical and Productive Resources

1. Do you have access to land for agricultural use? a) Yes b) No
2. If your response is 'yes' to question no 1, how do you get access to it?
   a) Through land distribution b) Shared with relatives
   c) Inherited from parents d) Purchased
   e) Sharecropping f) Other, specify
3. What is the total size of the following land types that you use?

No	Land Type	Size in Timad	Hectare
1	Cultivated land		
2	Fallow land		
3	Grazing Land		
4	Forest Land		
5	Others, specify		
Total			

4. What happened to the size of land holding over the last decades?
   a) Increased b) Decreased c) No change.

5. If your response is 'decreasing', to question no. 4, what was the reasons?
   a) Large household size b) Decline in quality of land
   c) Redistribution of land d) Others, specify

6. How do you rate the sufficiency of your land holding for farming?
   a) Scarce b) Sufficient c) Others, specify

7. What is the fertility status of your farm land?
   a) Poor b) Moderate c) Good

8. Have you sharecropped and/rented out your plot to other peasants on ye-ekul basis?
   a) Yes b) No

9. If your response is 'yes' to question no 8, why did you sharecrop out? (Multiple responses are possible):
   a) Lack of draft power b) Lack of seed access
   c) Unable to purchase technological inputs d) Illness
   e) Elderly and unable to operate it f) Having large farm size
   g) Others, specify _____

10. Have you ever sharecropped in land from other people? a). Yes b). No
11. If you sharecropped in, what was the size of the land in timad? _____
12. Why you sharecrop/rent in land?
   a) Need extra land b) Excess drought power
   c) Able to operate more land d) Others, specify

13. What was the type of crop you grew on it and the amount of harvest you got from the land in 2009/10 (2001/02 E.C.)? How much did you sell from each of this yield?

No	**Types of crops**	**Amount produced in quintal or Kgs**	**Amount sold in quintal or Kgs**
1	Teff		
2	Wheat		
3	Barley		
4	Sorghum		
5	Maize		
6	Beans		
7	Peas		
8	Others, specify		

14. What are the main constraints for your farmland? Identify the four main bottlenecks according to the order of importance:

No	Constraints	a)Yes	b) No	Rank Order	
1	Soil Erosion				
2	Water logging			First	
3	Poor soil fertility			Second	
4	frost			third	
5	wild life attack			fourth	
6	High consternation of stone on top soil				
7	Salinity				
8	Highly sandy				
9	Water Scarcity				

15. What do you think caused/aggravate the problem?
    a) Population pressure on land
    b) Removal of natural vegetation
    c) Poor farming practice
    d) Others, specify

16. Which of the following land management practice do you carry out in order to maintain and replenish the soil fertility of your farm land?

No	Management Practice	a) Yes	b) No
1	Use of Chemical fertilizer		
2	Using modern farming tools such as BBM		
3	Fallowing (field rotation)		
4	Crop rotation		
5	Manuring		
6	Inter-cropping		
7	Other, specify		

17. Do you use modern farm input to produce better yields? a) Yes b) No
18. If your response is 'yes' to question no 17, which one do you use and in what amount?

No	Type of input used	a) Yes	b) No	Amount in Kgs or liters
1	Improved seeds			
2	Chemical fertilizer			
3	Herbicides			
4	Insecticides			
5	Others, specify			

19. How do you evaluate the condition of rainfall in your area for crop production and livestock rearing?
    a) Normal b) Sufficient c) Insufficient
20. Did you experience crop failure due to shortage of rainfall? a) Yes b) No
21. If your response is 'yes' to question no 20, please mention the main rainfall shortage years? _____
22. What was/were the consequence/s?(multiple responsible is possible)
    a) Shortage of food b) Lack of pasture
    c) Shortage of drinking water d) Others, specify
23. What are your Sources of water for household consumption and for various agricultural purposes?
    a) River b) Protected spring
    c) Unprotected spring d) Piped water e) Others, specify
24. How long does it take (one way) to travel to this water source? Hour_____ minutes_____
25. How do you rate the current water availability for human and livestock consumption?
    a) Good b) Normal c) Sufficient
    d) Insufficient e) Others, specify
26. Do your household access to water for irrigation? a) Yes b) No
27. If your response is 'no' to question no 26, what are the main reasons?
    a) Lack of water source b) Lack of interest
    c) Lack of technical skill d) Others, specify
28. Do you have farm oxen? a) Yes b) No
29. If your response is 'yes' to question no 28, how much? in number_____

30. If your response is 'no' to question no 28, how you access?

a) Through borrowing b) Through sharecropping

c) Through Q*ixira* d) No means

31. Do you have other livestock, poultry, and beehives resource? a) Yes b) No

32. If your response is 'yes' to question no 31, would you tell us their number with their equivalent prices?

No	**Type**	**Number**	**Equivalence in cash (in *birr*)**
1	Cows		
2	Oxen		
3	Bulls		
4	Heifers		
5	Calves		
6	Sheep		
7	Goats		
8	Mules		
9	Horses		
10	Donkeys		
11	Chicken		
12	Bee Hives		

33. If you do not have, why this is so?

a) No capital to buy some b) No place to keep them

c) No person to look after d) Other, specify

34. What are the main constraints to livestock raising? Indicate their level of importance?

No.	Constraints	a) Low	b) Moderate	c) High
1	Shortage of grazing land			
2	Lack of additional fodder			
3	Disease prevalence			
4	poor veterinary services			
5	Shortage of water			
6	Absence of rural credit			
7	Others, specify			

35. What constrained you not to expand your crop production that can feed your household? Indicate the degree of influence?

No	constraints	a) Low	b) Moderate	c) high
1	Drought			
3	Landslides			
4	Pests and disease			
5	Erratic rainfall distribution			
6	Weeds			
7	Shortage of farm oxen			
8	Insufficient farm holdings			
9	Poor soil fertility			
10	Lack access to appropriate technology			
11	Inadequate extension services			
12	Limited know-how and skill			
13	Inability to apply sufficient modern farm inputs			
14	Shortage of cash income			
15	Others, specify			

36. Do you think that the extension services is adequate to enable you produce and access enough food for your family? a) Yes b) No
37. If your response is 'no' to question no 36, what you recommend to be included or improved?

_____

_____

38. Do you have access to market for your produce? a) Yes b) No
39. If your response is 'no' to question no 38, what do you think is the reason?

_____

_____

40. Do you have access to credit services form micro-institutions to supplement your livelihoods? a) Yes b) No
41. If your response is 'no' to question no 40, what do you think is the reason?

No	Problem	a) Yes	b) No
1	Need for mortgage		
2	High interest rate		
3	Unfavourable repayment period		
4	Limited capacity to reach all		
5	Others, specify		

IV. Household Income, Consumption and Expenditure

1. Does any of your household members work in no-crop production and livestock herding activities? a) Yes b) No
2. If your response is 'yes' to question no 1, would you tell us about the types of activities, persons engaged in, amount of income from the job, and the purpose for which you used the money?

No	Activity types	Member participated	Time spent per month	Estimated annual income		Earning used for		
				cash	in kind	1st	2nd	3rd
1								
2								
3								
4								
5								

3. If your response is 'no' to question no 1, of your member works in nonfarm activities, what are their reasons for not taking the opportunity?

No	Reasons for not working	a) Yes	b) No
1	Lack of spare time from agriculture		
2	Lack of awareness about its contribution value		
3	Lack of job opportunities		
4	Unable to work due to old age		
5	Health problems		
6	Others, specify		

4. Do you afford to buy food stuffs from market for your household consumption?
   a) Yes b) No
5. How much money do you generate from the following sources in 2009/10 (2001/2002E.C) crop year?

No	Income sources	Estimated amount of *birr*
1	Livestock and livestock products' sale	
2	Grain sale	
3	Poultry and its products sale	
4	Eucalyptus sale	
5	Firewood and grass sale	
6	Charcoal and *kubet* sale	
7	Local drink sale	
8	Local trade	
9	Rural credit	
10	Labor wage	
11	Others, specify	

6. How much did you spend for the following purposes in 2009/10 (2001/2002E.C) crop year?

No	Expense Type	Amount In Birr
1	Grain purchase	
2	Land use tax	
3	Religious feast expenses (*senbete, teskar, mahber*)	
4	Wedding	
5	Payment of credit	
6	Purchase of modern farm input	
7	Clothing expenses	
8	School expenses	
9	Medical expenses	
10	Others, specify	

V. Social Organizations, Networks and Support related issues

1. In which of the following community based (CBO) do you participate?

No	Institutions	Contribution per month		Benefit earned	
		Cash	In kind	Cash	In kind
1	*Mahber*				
2	*Hiqub*				
3	*Idir*				
4	*Hirpha*				
5	Others, specify				

2. Do you participate in various community labor organizations? a) Yes b) No
3. If your response is 'yes' to question no 2, in which of the following organizations do you take part?

No	Organization	a) Yes	b) No
1	*Debo/jigii*		
2	*Wanfala*		
3	*Humna*		
4	Others, specify		

4. Have you ever received relief support? a) Yes b) No
5. If you have had an opportunity to receive relief support, would you specify the amount of support in 2001 E.C. and 2002 E.C.?

No	Type of support	In 2001 E.C.		In 2002 E.C.	
		Type	Amount	Type	Amount
1	Free handout				
2	FFW				
3	Cash for work				
		1. Wheat 2. Maize 3. Oil 4. Cash			kg/birr

6. Have you ever received any help gifts from friends/relatives in case of danger to your crop and/or livestock a) Yes b) No

7. If your response is 'yes' to question no 6, what kind of help?
   a) In cash, state amount_____ b) In kind, state_____

VI. Food security and Household Coping Strategies to Food Shortage

1. What are the major staple foods that your household consumes?

No	Crop type	a) Yes	b) No
1	Teff		
2	Wheat		
3	Barley		
4	Maize		
5	Sorghum		
6	Pulses (horse beans, peas, chickpeas, etc)		
7	Oilseeds (linseeds, noug, sesame, etc)		
8	Vegetables (onions, tomato, cabbage, etc)		
9	Fruits(orange, banana, papaya, etc)		

2. Would you tell us the amount of grains and other food stuffs that cover the annual consumption/ food requirement of your household members?

No	Grain types	Amount in kilograms	Money equivalent in *birr*
1.	Cereals		
2.	Pulses		
3.	Oilseeds		
4.	Vegetables		
5.	Fruits		

3. Which foodstuffs are consumed at your home?

No	Foodstuffs	Pattern of consumption in a week?			
		a) frequently	b) sometimes	c) rarely	d) not at all
1.	*Biddena* (teff, sorghum, wheat, barley)				
2.	Bread (wheat, oat)				
3.	Porridge (wheat, barley, teff)				
4.	*Wat* (pulses)				
5.	Oil (oilseeds)				
6.	Meat (beef, lamb, goat)				
7.	Chicken or eggs				
8.	Milk or cheese				
9.	Butter				
10.	Potatoes				
11.	Vegetables (cabbage, onion, etc)				
12.	Fruits (papaya, banana, mango)				
13.	Others, specify				

4. Is there a time of a year when your household encounters shortage of specific foods?
   a) Yes b) No
5. If your response is 'yes' to question no 4, would you tell us the specific time?
   a) Whole year b) Nine months (March- November)
   c) Six months (May- November) d) Six months (December- May)
   e) Six months (March- August) f) Three months (June –August)
   g) Three months (March –May) h) Three months (December-February)
6. Do you meet all year round food requirements of your household members from own production? a) Yes b) No
7. According to your own self-assessment, is your household food secure?
   a) Yes b) No
8. If you are food insecure, in which months do your household face food shortage. (Mention name of months)_____
9. What factors do you think have caused food insecurity at your locality? Indicate their level of influencing causing the problem.

No	Major Causes of Food Insecurity	a) Yes	b) No
1.	Rainfall shortage		
2.	Animal disease prevalence		
3.	Poor soil fertility		
4.	Deforestation		
5.	Limited livestock number owned		
6.	Land shortage		
7.	Poor cash income position of households		
8.	Low non-farm income		
9.	Low use of modern farm input		
10.	Traditional farm implements		
11.	Lack of drought power		
12.	Poor access to credit		
13.	Weak market for output		
14.	Poor saving		
15.	High population pressure		
16.	Land fragmentation		
17.	Overgrazing		
18.	Poor fallowing practice		
19.	High age dependency		
20.	Poor educational attainment		
21.	Poor human health services		
22.	Inadequate veterinary services		
23.	Poor road and communication networks		
24.	Costly social and religious ceremonies		
25.	Poor food rationing		
26.	Weak extension services		
27.	Weak rural organizations		
28.	Others, specify		

10. How do you cope with the problem of food shortage?

No	Coping strategy	a) yes	b) No
1	Changing cropping pattern		
2	Migrating to nearby town for wage labor		
3	Consuming less preferred foods		
4	Borrowing grains from relatives		
5	Borrowing grains or cash from money lenders		
6	Migrating to others rural areas for wage labor		
7	Selling off small animals		
8	Selling grass and firewood		
9	Rely on relief grains		
10	Sell off farm oxen		
11	Leasing out land		
12	Engaging in petty trade		

11. What food consumption related coping mechanisms do you use in times of food crises? How often did you cope using the following mechanism?

No	Strategy	How often?			
		a. **everyday**	b. **2-5 times /week**	c. **1-2 times / week**	d. **never**
1	Eating food that were less preferred				
2	Borrowing grain or money to buy food				
3	Buy food on credit basis				
4	Receiving donation from relatives or friends				
5	Reducing consumption during each meal				
6	Skipping meals for adults to feed children instead				
7	Reducing the number of meal per day				
8	Not eating for whole day some times				

Annexes II

Energy composition of some food types

No	Sources and Products of Food	Food Energy (Kcal/100 Grams)
1	**Barley (black)**	
1.1	Flour	370.00
1.2	*Enjera*	124.90
1.3	Bread	195.60
1.4	Split roasted *(qolo)*	386.60
1.5	Porridge	150.30
2	**Barley (white)**	
2.1	Flour	368.00
2.2	*Enjera*	125.80
2.3	Bread	202.40
2.4	Split roasted (*qolo*)	398.10
2.5	Porridge	116.30
3	**Maize (yellow)**	
3.1	Bread	233.40
3.2	White, boiled(*nifro*)	182.80
3.3	Whole, roasted (*qolo*)	404.20
3.4	On cob, boiled	186.50
3.5	On cob, roasted	300.70
4	**Maize white**	
4.1	Bread	223.40
4.2	White, boiled(*nifro*)	170.10
4.3	Whole, roasted (*qolo*)	387.20
4.4	On cob, boiled	152.00
4.5	On cob, roasted	276.50
5	**Emmer wheat (*ajja*)**	
5.1	Bread	239.30
5.2	Porridge	140.70
6	**Sorghum, red (*zangada*)**	
6.1	*Enjera*	126.10
6.2	Porridge	135.60
6.3	Boiled (*nifro*)	143.10
6.4	Roasted	*
7	**Sorghum, white (*mashila*)**	
7.1	*Enjera*	*
7.2	Porridge	135.40
7.3	Boiled (*nifro*)	124.50
7.4	Roasted	402.40
8	**Teff, eragrostis (white)**	
8.1	*Enjera*	145.00
8.2	Porridge	193.70

No	Sources and Products of Food	Food Energy (Kcal/100 Grams)
8.3	Bread	214.30
9	**Teff, eragrostis (black)**	
9.1	*Enjera*	155.90
9.2	Porridge	165.40
9.3	Bread	220.00
10	**Wheat (black)**	
10.1	Enjera	147.70
10.2	Bread	205.90
10.3	Porridge	157.30
10.4	Boiled (nifro)	178.10
10.5	Split, boiled	67.90
11	**Wheat (white)**	
11.1	Enjera	145.60
11.2	Porridge	222.00
11.3	Bread	142.70
11.4	Boiled (*nifro*)	211.30
11.5	Roasted (*qolo*)	391.60
11.6	Split, boiled	65.10
12	**Potato**	
12.1	Potato oromo boiled	100.60
12.2	Potato irish boiled	89.70
13	**Pulses products**	
13.1	Broad beans' (split or *kik*)	353.10
13.2	Broad beans whole, dried boiled (*nifro*)	149.50
13.3	Broad beans whole, dried, roasted and then boiled	275.90
13.4	Chick peas whole dried, boiled (*nifro*)	180.90
13.5	Chick peas whole , fresh, roasted (*qolo*)	238.10
13.6	Lentil, sauce without chili (split)	151.20
13.7	Peas, sauce without chili (split)	162.00
13.8	Peas, whole, fresh, boiled (*nifro*)	157.80
13.9	Peas, whole, dried, boiled (*nifro*)	157.80
13.10	Peas, whole, roasted, and then boiled	271.50
13.11	Vetch, sauce, without chili	124.10
14	**Vegetables**	
14.1	Cabbage, boiled	23.70
14.2	Garlic, boiled	125.70
14.3	Green pepper boiled	36.60
14.4	Green pepper raw	88.10
14.5	Onion (shallot, boiled)	92.60
14.6	Pumpkin, boiled	24.90
14.7	Pepper (chili), boiled	149.30
14.8	Tomato raw	30.50
14.9	Tomato boiled	20.50

Declaration

I, the undersigned, declare that the thesis is my original work, has not been presented for a degree in any other university and that all sources of materials used for the thesis have been duly acknowledged.

Declared by:

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Candidate

Confirmed by:

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Advisor

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