LIVELIHOOD DIVERSIFICATION AND HOUSEHOLD FOOD SECURITY: CASE STUDY IN SODO ZURIA DISTRICT, SOUTHERN ETHIOPIA

A THESIS SUBMITTED TO SCHOOL OF GRADUATE STUDIES OF ADDIS ABABA UNIVERSIFTY

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BY

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ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

COLLEGE OF DEVELOPMENT STUDIES (CDS)

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Acronyms

AIDS – Acquired Immune Deficiency Syndrome

CSA – Centrals statistics Agency

CIDA – Canadian International Development Agency

CPR – Crisis Prevention and recovery

DFID – Department for International Development

FAO – United Nations Food and Agriculture Organization

FSCB – Financial Sector Capacity Building Project

FSP- Food Security Program

IHHDV – Herfindahl-Hirschman Diversity Index

HIV- Human Immune Virus

IFAD – International Fund for Agriculture Development

IFPRI – International Food Policy Research Institute

OLS - Ordinary Least Square

SNNPR – Southern Nations and Nationalities People Representatives

UNDP – United Nations Development Program

US$ - United States Dollar

WFP – World Food Program

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Chapter One: Introduction

1.1 Background

Ethiopia is a nation of a large population with a diverse set of livelihood structures and multiple resource utilization options. It is known that 84 % (CSA, 2008) of the population lives in rural areas engaged in agriculture-based economic activities. Such a diverse set of economic activities is becoming a common phenomenon in the sector. The diversity can be considered as a great advantage in that it provides other sources of income, in addition to the primary rural enterprises. According to Ellis (1998), creating other sources of income has a great impact on households, in terms of providing security against external shocks, coping up with seasonality and in generating additional income. It is also observed that many rural poor households in Ethiopia rely on a diverse set of income-generating activities in order to meet their food demand. But the level and pattern of diversification differs depending on the socio-economic status of each household. The majority of the households in the country as well as in other similar nations prefer to follow diverse livelihood patterns in order to build sustainable food access throughout the year rather than to meet their secondary consumption requirements.

In a world where obesity has become an epidemic, under nutrition mainly due to food insecurity has also become pandemic in countries like Ethiopia where millions are still struggling for their bread each day. The problem is worsening from time to time despite massive resources invested each year on development activities, food security programs and humanitarian aid (Timothy and Frankenberg, 2007). Although it is difficult to point out one specific contributing factor to the causes of food insecurity for a given region, it is necessary to determine the attributes that lead to such conditions (Ellis, 2004).

In sub-Saharan countries such as Ethiopia, food insecurity at the household level arises from several factors and it appears to be much more devastating when several causes militate at the same time (Swift, et.al.1989). According to FAO (1988) in Eastern African countries environmental risk is the most common trigger for the episodes of acute household food insecurity, next to disease, market risk and conflicts between and within states. According to Degeffa (2002), these causes can be grouped under three main types as natural causes, socio economic factors, and policy failures combining both natural factors and man made process. In order to ensure future food access and cope up with such variable and dynamic contributing factors, households follow a diverse set of livelihood strategies which are consistent with their specific environmental characteristics. Even though it is well known that households follow different strategies such as livelihood diversification, livelihood intensification, migration etc..., it is important to assess the whole effect of a given livelihood strategy in sustaining and improving food security from a broader perspective.

1.2 Statement of the Problem

Food security has been a hot issue since the beginning of the 1970th. Many scholars focus on how to create conducive conditions for people to have access to food at any given time. Although much has been written and done to achieve this (such as Sen (1981), entitlement approach, critiques of the entitlement approach by Swift (1989) a and b, etc...), there are still many people suffering from and dying of hunger each and every other day or from diseases caused mainly by under nutrition. The impact is greater on women and children who are highly vulnerable, in areas where conflict and harsh climatic conditions exist and even under normal circumstances.

In sub-Saharan countries, tension to access equal resource utilization in order to achieve food security forces people to modify their livelihood strategy successively. The same is true in

Ethiopia, where there is successive drought affecting the food security efforts of 5.2 million people aggravated by a combination of factors such as poor and erratic rainfall, high food and fuel prices in 2008, and the global financial crisis (WFP, 2009).

In 2009, for instance, WFP assisted almost ten million people in Ethiopia by providing emergency food assistance. Among these, there are 6.2 million people who are highly affected by recurrent drought. Recently, the southern part of the country has been facing high deficit in food availability and access which has led to famine and death. Wolaita, Sodo zuria district is one of the areas where food security is fragile due to high population density with a higher than average family size, small land holdings per household, and heavy reliance on rain. As a result, any reliance in access to normal food sources is likely to result in a decline in nutritional status (Dagnew, 1994). Belg crops in the high and middle lands accounts for approximately 70% of annual production (Dagnew, 1994). The main crops normally produced are cereals, maize, and haricot beans. In 1999, findings indicated that Soddo Zuria was considered as the second worst affected district next to Humbo needing immediate attention in the Zone (Veen, 2000). The same year post-Meher and pre-Belg harvest assessment findings indicated that respectively an estimate of 247,000 and 425,770 people would be in need of food aid in Wolaita and where the above two districts are the worst case scenarios (Veen, 2000). According to the focus group discussion conducted in Sodo Zuria District, households found in Kokate Mara Chare, Damot Waja, Wachiga Busha and Buge Wanche, indicated that, by early 2007 and 2008, it was an occurrence of two consecutive years of late Belg rains and low Meher crop production performance resulting in exhaustion of many households' main coping strategies. Low root crop availability in combination with late Belg rains, lack of pasture and drinking water in the highlands, and disease in the low lands as well as stress sale of livestock, has resulted in a decline of food security.

On the other hand, the people on their part are taking a number of livelihood strategies, including agricultural intensification, and livelihood diversification, which could help them attain their food security gaol, but are still unable to escape from food shortage and insecurity.

It is thus important to critically understand the role livelihood strategies of rural communities and households in order to bring about positive change in rural livelihood.

1.3 Objectives of the Study

1.3.1 General Objective

The general objective of this study is to investigate the role of livelihood diversification on the food security status of rural farm households in the Sodo Zuria district of the Southern Nations, Nationalities and Peoples Regional State (SNNPR) of Ethiopia.

1.3.2 Specific Objective

The specific objectives of the study are to:

- determine the level of diversification of each household;
- assess the relationship of livelihood diversification with income, and availability of food and,
- compare which types of livelihood strategy improve rural households' objective to attain food security.

1.4 Scope and Limitations

In assessing the impact of livelihood diversification on food security, the study has its scope on assessing the effect of livelihood strategy on the access and availability aspect of food among rural households of Sodo Zuria. Furthermore, the assessment relies mainly on

livelihood diversification at the household level rather than on each individual person in a household. This is because much of a households' income is collective and it is the economic unit in Ethiopian context.

1.5 Significance of the Study

This study tries to shed light on the issue livelihood and food security by contributing facts to the debate on livelihood diversification on the one hand, and livelihood intensification on the other. The finding of the study may have implications for policy and decision makers on food security. It may also give insight to the "diversification versus intensification" debate in the context of sustainable food security.

1.6 Organization of the Study

The study is organised as follows: Chapter two deals with the relevant literature review of relevant conceptual and empirical studies, on the multiple facets of food security and livelihood strategies. Chapter three is a description of the research methodology which relate to the assessment of the role of livelihood strategies on food security in the study area. Chapter four presents the findings and provides some discussion on them. Finally, the summary of the main observations, conclusions and policy implications are highlighted.

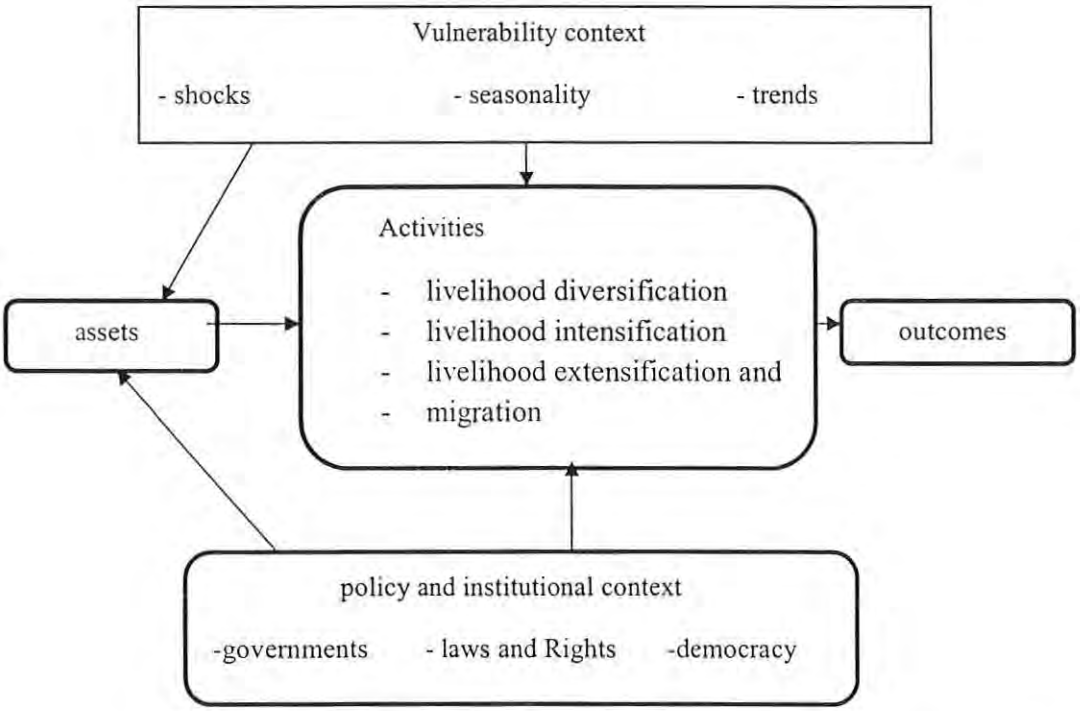
Chapter Two: Literature Review

2.1 Conceptual Analysis on Livelihood, Livelihood Diversification and Food Security

2.1.1 Livelihood

Many literatures define livelihood on the basis of the conceptual setting it combines. For the lay man the term livelihood suggests what people do in order to make a living. But the term relates to many other aspects of life not just to a single economic activity. For example, according to Ellis (2004), livelihood refers to the economic activity of people, the resource available to lead a satisfactory living, the risk factors that must be considered in managing the resources and the institutional and policy setting which might help or hinder the use of resources in the pursuit of improving life. Basic livelihoods approach or framework is thus illustrated in the following figure.

Figure 2.1 The basic livelihoods framework



Source: Ellis & N. Mdoe(2003a, p. 4)

In this framework. resources are referred to as 'assets' and are also classified into five different types; namely, human capital, financial capital, physical capital, natural capital, and social capital. According to Carney (1998, p. 45) assets are described as building blocks available to people and to households to build their livelihood in some fashion. The various resources or assets are described as follows:

- *Natural Capital,* include stocks and, their flows of natural resources and environmental services available in a particular agro ecological settings;
- *Financial Capital,* consists of savings and access to credit;
- *Physical Capital* ,includes infrastructure and transport;
- *Human Capital,* comprises demographic and gender structures, the body of education and skills, knowledge, good health needed to produce effectively;
- *Social Capital,* relates to social networks, claims, associations and social relationships more generally including consensual norms and relationships of legitimate authority.

(Ellis and Allison 2004)

It must be noted that these asset categories are assumed to serve important roles in distinguishing asset types that tend to link with policy considerations.

As shown in figure 2.1. the livelihood framework includes the term livelihood, which is defined as, what people do in order to make a living. The risk factors are summarised as 'vulnerability context', and the structures associated with authority, laws and rights, and democracy are referred to as 'policy and institutional context'. People's livelihood efforts within these contexts will result in positive or negative impact on vulnerability of food insecurity (Ellis and Allison 2004).

The framework is also designed to be people-centred and holistic, thus, providing integrated view of how people make a living within the evolving social, institutional, political,

economic and environmental contexts (Carney, 1998 p. 47). The strength of this framework which is supported by many literatures is its ability to consider awareness of the asset status of poor individuals or households. Many writers agree that the framework looks positively at what is possible rather than state negatively how desperate things are. As articulated by Moser (1998.p1), the approach "seeks to identify what the poor have rather than what they do not have, and it strengthens people's own inventive solutions, rather than blocking or undermine them".

Generally, a popular definition is provided by Chambers & Conway (1992, p.296) wherein livelihood is defined as the capabilities, assets and activities required as a means of living.

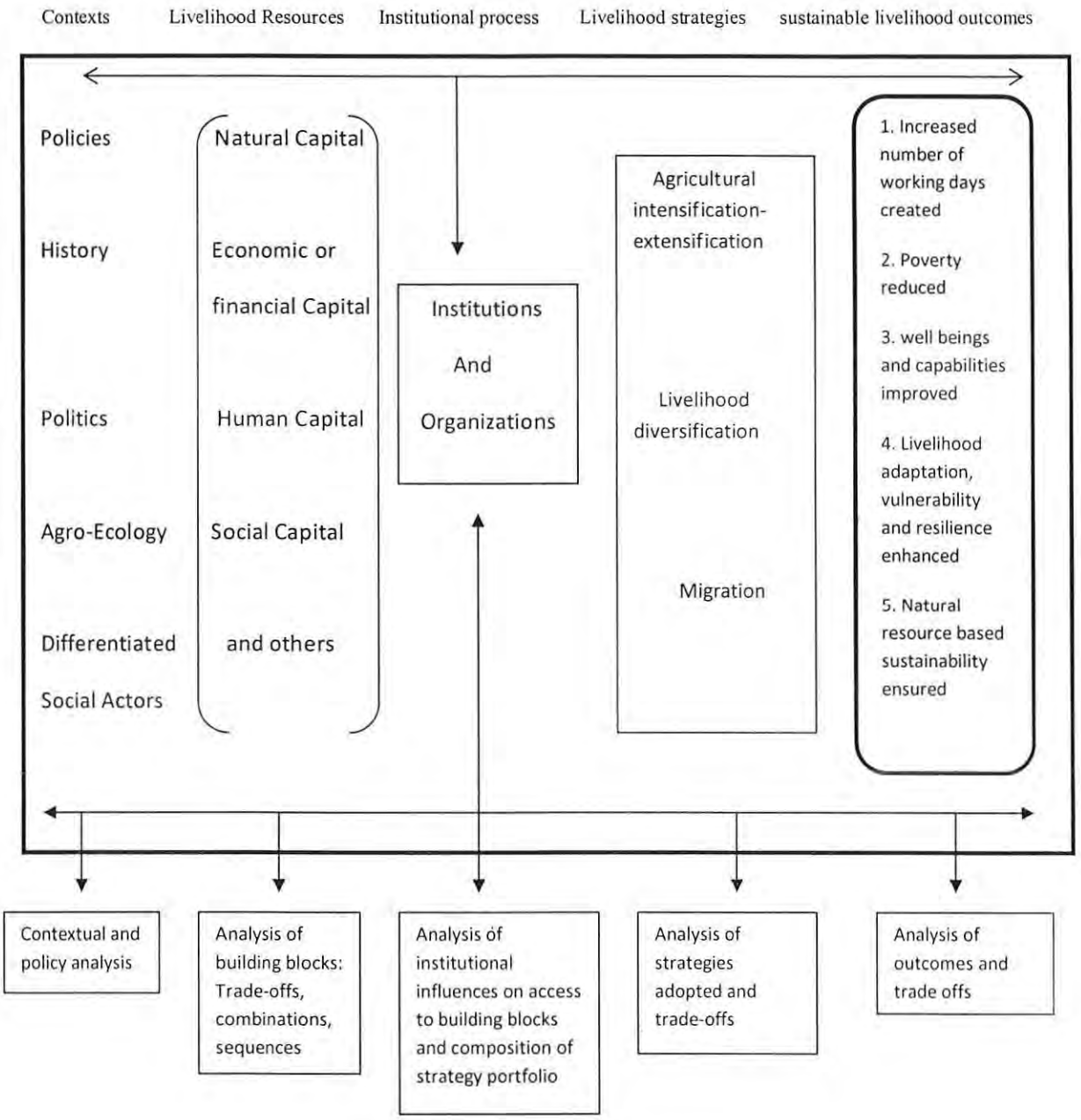
2.1.2 Sustainable Livelihood

Scoones (1998, p. 5) proposed a working definition for sustainable livelihood. According to him "sustainable livelihood is a livelihood which can cope up with and recover from stress and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base." This definition gives attention to contextual and institutional settings, emphasizes on multiple types of capital available as resource, and the thinking of livelihood strategies as multiple and dynamic phenomenon constrained by the resource available. (Swift, 2002)

On the other hand, this definition takes food security as not just an issue of productivity, or even sustainability of production or of entitlement's, but views food security as dependent on how people, especially the poor, get access to production, exchange and capabilities for food (Heyer, 1996). The only difference between the entitlement approach definition and this definition is that this approach takes a closer look on the way institutions work, how they are used by different categories of people, and how they develop over time. Generally, the above

approach defined allows a wide range of influences to be brought into a single frame of analysis. Figure 2.2 shows the sustainable livelihood framework.

Figure 2.2 The sustainable livelihood approach



Source: Scoones 1998, p.4

The figure may be read as follows: situated in particular contexts, particular assets or forms of capital are accessed by households, and are used to construct livelihood strategies, which result in positive or negative outcomes.

Contexts

"The most important aspect of contexts include historical and political factors, current policies, climate, environment, demography and existing patterns of social differentiations" (Scoones, 1998. p84). Context is incorporated in the sustainable livelihood approach based on the thought that development is path dependent, where previous events define or limit to some degree the options available for current livelihoods. For example structural adjustment policies, infrastructural spending changes, and/or administrative decentralization are all likely to affect the range of livelihood options available to different groups of people.

Assets

An attempt made to draw the concept of asset based livelihoods has led to the development of frameworks for livelihood conceptualisation (see, Ellis (2000); Carney, (1998) as good examples). It is becoming evident that rural people engage in many different types of income generating and livelihood activities but their ability to engage in non-agricultural activities is often very dependent on their access to assets (Taylor et.al, 1996). On the other hand, Reardon (1997) states that conducting different types of economic activity within the household are dependent on the different combinations of financial, human, social, physical and natural capital.

Institutions

Looking at institutional process, one conceives that its attributes range from legal structures to social arrangements supported by moral pressure or sanctions. The arrangements and

organizational forms of institutions significantly determine the access of individuals and households to five types of livelihood resources (Swift, 2002). In most poor countries, gender and caste negatively affect the ability to access resources and restricts the involvement of some social groups to certain production activities (Carney. D, 1998). On the other hand, institutional functioning is dynamic that depends on the contextual changes or results from the adoption of different livelihood strategies (Bryceson and Jamal, 1997).

2.1.3 Livelihood Strategies

In a rural context, households may construct four main categories of livelihood strategy:

- Livelihood *intensification,* where the value of output per hectare of land or per animal is increased by the application of more labour, capital or technology;
- Livelihood *extensification,* where more land or animals are brought into production at the same levels of labour, capital or technology;
- Livelihood *diversification,* where households diversify their economic activities away from reliance on the primary enterprise (livestock or cropping), typically seeking a wider range of on- and off- sources of income;
- *Migration,* where people move away from their initial source of livelihood, and seek a living in another livelihood system.

Swift (1989, p.86)

According to Swift and Hamilton (2002), although conceptually it is useful to distinguish these strategies from each other, typically, households pursue a combination of strategies together or sequentially and may use similar strategies for different reasons. On the other hand, households may use particular strategies to meet minimum consumption needs in the present, or to achieve ongoing accumulation (Davies, 1991).

At the same time, contextual influences far outside the control of individuals or communities, and equally applicable to (though not necessarily with equal impact) all of them, are also significant determinants of the strategies available (Swift, 2002, P.86).

2.1.4 Livelihood Diversification

Many literatures, arising from a variety of disciplines, have confirmed that rural people in Africa and Asia do not normally specialise in livestock, or crop production. Rather, a majority of rural producers have historically diversified their productive activities to encompass a range of other productive areas (Hussein & Nelson, 1998, p.3).

In this study, livelihood diversification is considered as "the process by which rural families construct a diverse portfolio of activities and social support capabilities in the struggle for the survival in order to improve their standard of living" (Ellis, 1998, p.5). "This livelihood strategy includes both on- and off-farm activities which are undertaken to generate income additional to that from the main household agricultural activities, through the production of other agricultural and non-agricultural goods and services, the sale of waged labour or self employment in small firms" (Hussein & Nelson, 1998, p.3).

The diversification literature tends to categorise livelihood income sources as either farm or non- farm. Non- farm activities are often considered to be non-natural resource-based, but activities as diverse as ecotourism and brick-making, are also considered natural-resource based (Ellis, 2004). It must be noted that access to natural resource is an important factor in revealing availability of diversified economic activity for rural households.

On the other hand, although livelihood diversification is an important strategy by which rural people may work to achieve sustainable livelihood, the strategy generally operates in conjunction with other strategies which also may contribute to the formation of sustainable

livelihood (Hussein & Nelson, 1998, p.4). One of the strategies which complement livelihood diversification, and which is being considered as part of this study, is agricultural intensification.

In defining agricultural intensification, Carney (1998) employs the definition by Tiffen et. al. (1994) which states it as increased average inputs of labour or capital on a small holding, either cultivated land alone, or on cultivated and grazing land, for the purpose of increasing the value of output per hectare. Carney pointed out also many of the important linkages between agricultural intensification, economic diversification, and market infrastructure. For instance, when livelihood intensification is affected by market proximity, farmers will have the opportunity to be involved and generate farm and non-farm income from a wide range of sources. A proportion of this income may then be used to invest in the productivity of their landholdings. In this case, we can clearly see the complementary relationship between livelihood diversification and agricultural intensification.

2.1.5 Lines of Thought between Livelihood Diversification and Agriculture-Centred Orthodoxy

Available literature on livelihood diversification argues along two lines of thought. These are the proponents of the importance of diversification on the one hand, and those who regard diversification as disadvantageous for people making their livelihood in rural setting on the other hand (Degefa, 2005). Certainly in Sub-Saharan Africa, diversification can be represented as a failure of agriculture to provide sufficient livelihood for substantial rural dwellers (Bryceson, 1990). According to Ellis and Allison (2004), the main factors driving 'deagrarianization' in rural Sub- Saharan Africa would appear to be:

- Decreasing farm size caused by sub-division at inheritance, to the point where even under favourable agro-economic conditions, farming can only provide a part-livelihood;
- Increasing inability of young people to access enough land to take up farming as their main occupation; and
- Increased climatic variation, causing greater extremes across seasons and years etc.

Deagrarianization hypothesis obtains qualified support and some key findings emerged from rural livelihood researches in eastern and southern Africa such as the following:

- The rural poor tend to exhibit a highly eroded asset status, manifested by land holdings below 0.5 hectare, no cattle or goats, low levels of educational attainment of household members, no savings, and decline in some elements of 'social capita' and, depleting effects on household labour caused by HIV/AIDS infections (Ellis and Allison, 2004, p.8).
- The tremendous reliance on subsistence amongst customary tenure small farmers in general, and especially amongst poor rural households; subsistence ratios with respect to maize production are commonly in the range of 80 to 95 percent, and for grain deficit households can be routinely 100 per cent (Ellis and Allison, 2004, p.8).
- Subsistence ratios in total household income that decline steeply with rising per capita income: for example, in the Malawi country study comprising 280 households, the top income quartile exhibited a subsistence ratio in total income of 44 per cent, while for the highest income quartile this fell to 18 per cent (Ellis and Allison, 2004, p.8).

These groups are the most vulnerable and are most heavily reliant on agriculture, and most strongly locked into subsistence within agriculture. As a result, income earned from non-farm sources help households to gain access for food. Shipton (1992), Reardon (1997), Ellis

(1998), and Degefa (2005) are along the proponents of evidence for the need to diversify livelihood as a central mechanism to tackle rural poverty and food insecurity.

On the other hand, Lipton (2001) and Berry and Cline (1979) argue that diversifying sources of livelihood adversely affect an economy and relates to the issue of declining 'specialization' in single type of commodity production. As a result, the shift of labour from agriculture to non-agriculture can negatively affect growth in agriculture and the whole economy at large.

2.1.6 Food Security

Since the beginning of the 1970's, many definitions and conceptual models of household food security have been given (Degefa, 2005). The series begins with the report of the World Food conference of 1974 and then gathers momentum through the 1980's (Maxwell & Smith, 1998). Some of the definitions that have been influential over the year are the following:

"The ability to meet target levels of consumption on a yearly basis" (Simawalla and Valdes, 1980.p264)

"Ensuring that all people at all times have both physical and economic access to the basic food they need" (World Food Summit, 1996)

"Access by all people at all times to sufficient food and nutrition for a healthy and productive life" (The Agricultural trade development and assistance act of 1990, p.480)

Many of the definitions and conceptual models, including the above ones, agree on the key defining character of household food security as secured and sufficient access of food at all times. This reflects the commonality regarding the terms sufficiency, access, security and time which are described next.

2.1.6.1 Sufficiency

Sufficiency is a term referring to the concept of having enough food (Maxwell & Smith, 1998, p.9). Although the definitions of food security mostly refer to "food," the term sufficiency mainly concerns calorie. This is because analysts preferred the term based on the principle that other needs are usually satisfied when calorie intake is satisfactory (Maxwell & Smith, 1998, p.9).

On the other hand, since estimating precise calorie needs for different groups in the population is difficult, some have concluded that all estimates of nutritional requirements have to be treated as value judgements (Maxwell & Smith, 1998, p.9). Notwithstanding the difficulty of measurement, Heald and Lipton (1984) introduced "proportionate shortfalls" in assessing whether people have access to enough food or not, and Maxwell et.al (1990) have introduced the idea of the "intensity "of food insecurity.

2.1.6.2 Access and Entitlements

This is about whether individuals and households are able to acquire sufficient food or not. It is often argued that the focus on access is a phenomenon of the 1980's, largely, resulting from the pioneering work of Amartaya Sen (1981) on food "entitlements". According to his approach, individual's entitlement is based on the level of endowment which is transformed through production and trade into food or commodities and exchanged for food. His theory on food entitlement has had a considerable influence on shift in thinking about food entitlement. This is because the approach involves a wider perspective on the ability of a household to gain the access of food (Maxwell & Smith, 1998).

In addition, many social anthropologists observed that vulnerable populations exhibited a sequence of responses to economic stress, giving recognition to the importance of behavioural responses and coping mechanisms in food crisis (Campbell1990).

Swift (1989) made an important extension to the entitlement theory by focusing on the role of investments, stores and social claims in determining household vulnerability to famine. He has dealt with households which are able to generate surplus over and above their basic food requirements. The excess resources are thein diverted to assets of three kinds which can be drawn down when households face a crisis.

2.1.6.3 Security

This term refers to secured access to enough food. While dealing with security it is important to link risk with food entitlement. According to (Maxwell & Smith, 1998), the risk profile of individual households and communities can be determined by the channels through which their access to food is normally mediated and by the assets which are available to them as buffers. For instance, if a household sacrifices large amount of its asset in order to gain insufficient amount of food through a risky contextual and environmental setting, the level of risk in accessing secured food in order to feel the food gap existed will be high.

Generaly, Jonsson and Toole (1991) determined households which achieve adequate access to food while using only a small proportion of available resources as the most food secured and those who fail to achieve adequate access even by devoting a large proportion of available resource as the most food-insecured.

2.1.6.4 Time

Following the lead of the World Bank (1981), it has become conventional to draw a distinction between chronic and transitory food insecurity. Chronic food insecurity means

that a household runs a continually high risk of inability to meet the food requirements of household members. In contrast, transitory food insecurity occurs when a household faces a temporary decline in the security of its entitlement and the risk of failure to meet food needs of short duration. CIDA (1989) has further divided this category into cyclical and temporary food insecurity. Temporary food insecurity occurs for a limited time because of unforseen and unpredictable circumstances while cyclical or seasonal food insecurity occurs when there is a regular pattern in the periodicity of inadequate access to food.

2.1.7 Shift in Thinking on Food Security

Famine and mal-nutrition had existed long before the introduction of the concept of food security. Food security started to become an issue when the world turned its face towards combating the increasing existence of malnutrition and famine at global level.

In 1974, FAO took the initiative to call upon the world nations to take part in the first world food conference. The conference's main emphasis was on how to enable the world to feed every individual at the global level and to asses how every nation should be accountable for reducing food self-insufficiency (Degefa, 2005).

Since then, food security has become central to academic research. Main studies started to be conducted with the aim of identifying explanations for food insecurity, particularly in regions where the problem had been prevalent (Degefa, 2005). On the contrary, there has been also a considerable shift in thinking and concern regarding food security. One of the vital shifts was the transformation of understanding food security from 'food first' to 'livelihood perspective' (Degefa, 2005). This shift of thinking was mainly due to some of the following important factors.

- The fact that many empirical observations on food insecurity has shown that the victimized people focus on long term objective rather than attaining the short term satisfaction of immediate food consumption.
- The beginning of an application of an analogy of concepts of environmental management, i.e. 'sensitivity' and 'resilience' in explaining the situations before, during and after food crisis of households.
- The relatively recent quest for the holistic understanding of people's opportunities, constraints and the interactions between contexts of access to assets and institutions resulting in either desirable or undesirable out come.

(Degefa, 2005, p. 214)

2.1.8 Conceptual Framework for Analysing Food Security

IFAD (2001) classified food security difficulties into two areas based on level and shock. And a consequent sub-division is made to yield a four dimensional characterization of food security which are stated below.

- The ability to improve and maintain the level of acquirement
- The ability to cope with shocks to acquirement
- The ability to improve and maintain the level of utilization; and
- The ability to cope with shocks to utilization

This four-fold classification provides a framework for analysing the determinants of household food security.

2.1.8.1 Determinants of the Level of Food Acquirement

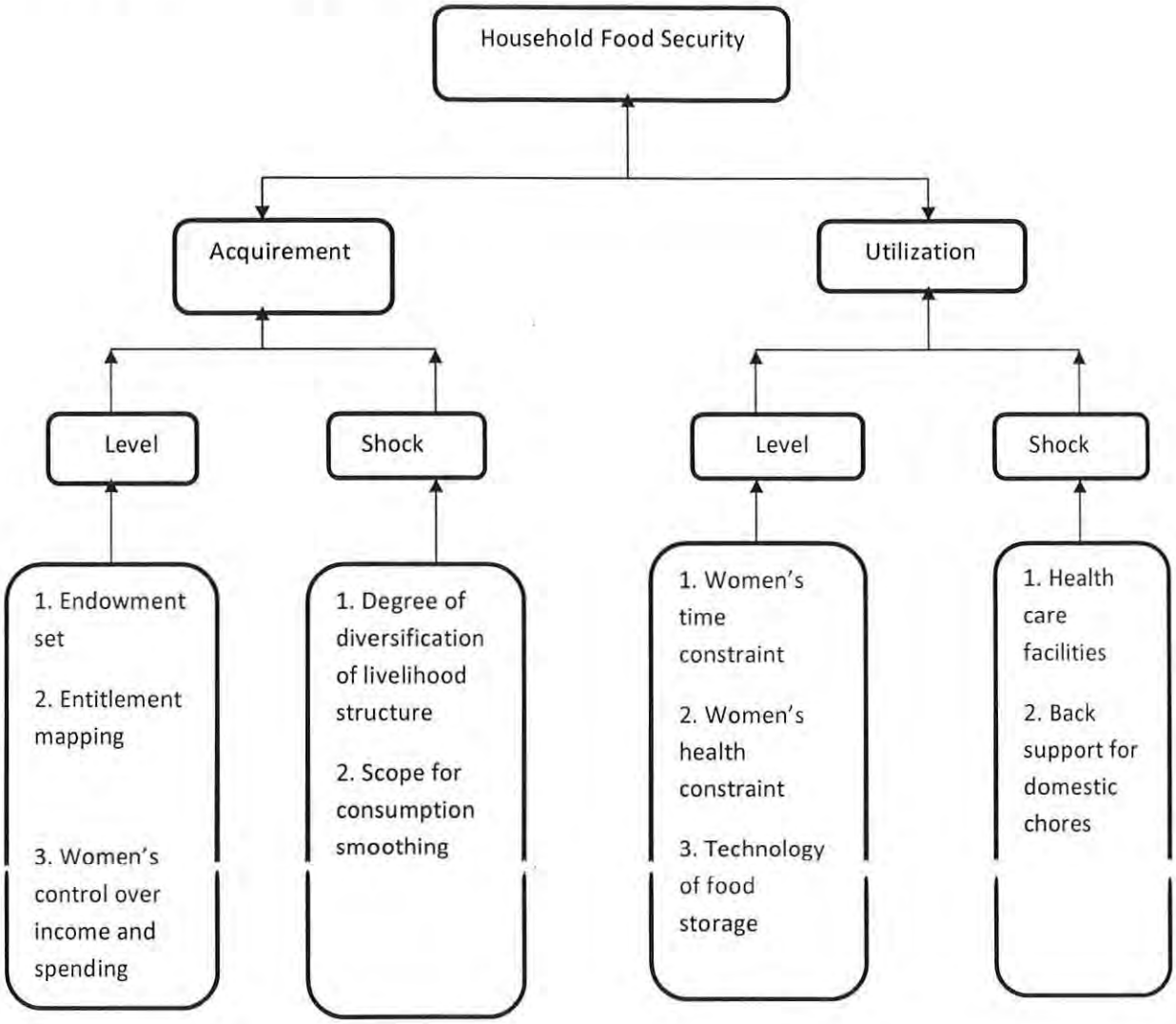
Following Amartya Sen's (1981) entitlement analysis, the first two determinants of the level of acquirement can be described as the endowment set and entitlement mapping. Endowment

set consists of all the resources a household owns or over which it has full rights while entitlement mapping refers to the rate at which the resources of the endowment set can be converted into food (IFAD, 2001). The endowment set and entitlement mapping together determine a household's ability to acquire food but the questions of whether or not and to what extent the ability to acquire food is converted into actual procurement is determined by the gender and health status that controls the households income and expenditure (IFAD,2001).

2.1.8.2 Determinants of Ability to Cope with Shocks to Acquirement

Shocks to acquirement can come from several sources, including crop failure, unemployment, higher cost of food, etc. (Maxwell & Smith, 1998). Degree of livelihood diversification is the most important determinant of coping ability that reduces fluctuations in income (IFAD, 2001). Thus, if a household has a greater degree of diversification, the greater will be its ability to cope with temporary shocks to acquirement. The other determinant is the scope for consumption-smoothing. This refers to the ability of a household to maintain the normal level of food consumption during an income shock (IFAD, 2001). The whole range of determinant is included in figure 2.3.

Figure 2.3 Flow chart of the determinants of Household Food Security



Source: IFAD (2006, p.64)

2.1.8.3 Determinants of the Ability to Improve and Maintain the Level of Utilization

Even if there is a certain level of food acquirement in a household, food security level would depend on how well the food was utilized. In analysing the level of utilization, the most important determinant of food utilization is women's time constraints (IFAD, 2006). Mostly poor women living in developing countries face time shortage, which forces them to compromise the quality of food preparation. On the other hand, such women face health

constraints which lower the food security of the household because food preparation tasks cannot be carried out in the most possible manner. Storage is also another determinant leading to in substantial losses both in the quality and quantity of food.

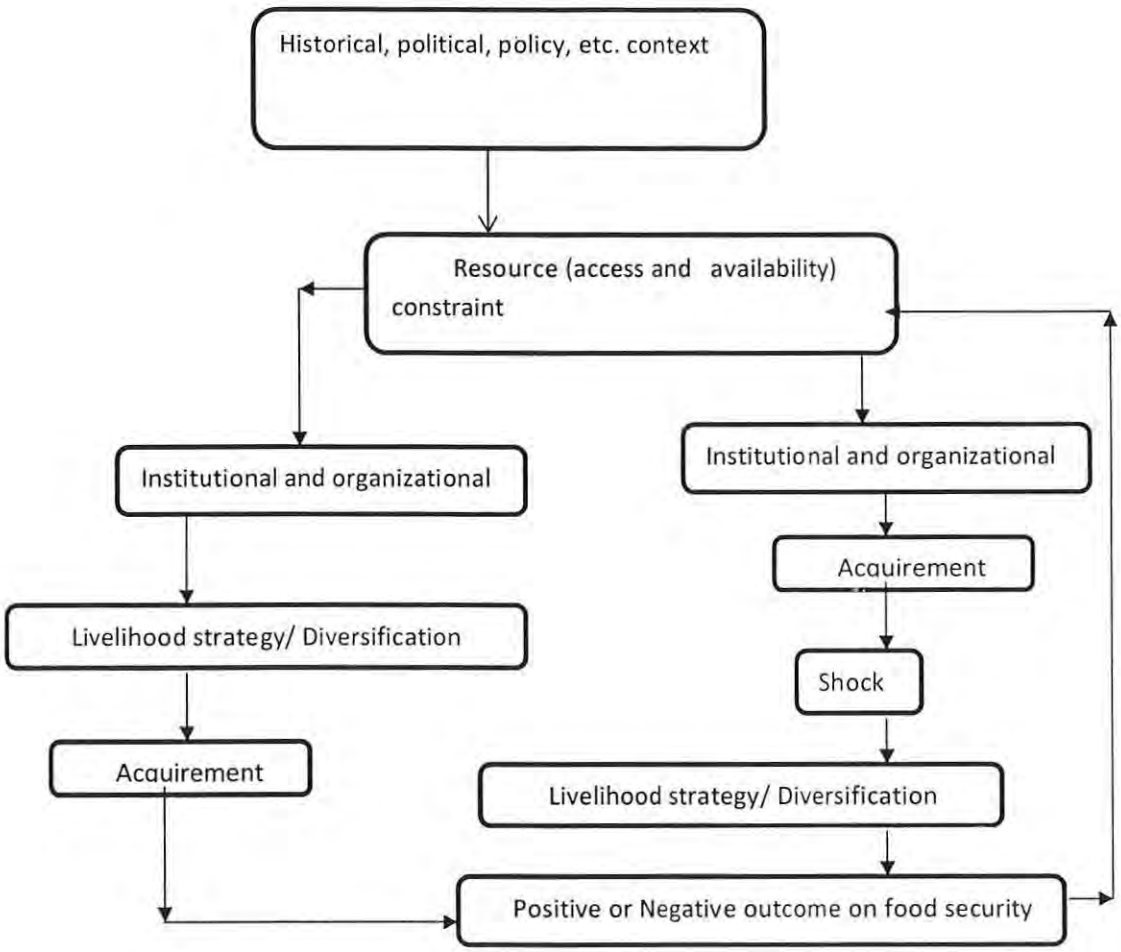
2.1.8.4 Determinants of the Ability to Cope with Shocks to Utilization

Shocks to utilisation usually arise due to sudden obstacle in the ability of women to play their role. The ability to cope with such shocks depends on two sets of factors; namely, the availability and the quality of women's health-care facilities and the existence of support network that can provide help to women in the performance of domestic chores (IFAD, 2001).

2.1.9 Links between Livelihood Diversification and Food Security

According to Borton and Shohan (1991), indicators such as coping ability provide information on the capacity of the population affected by shocks and disaster in order to withstand the effects. Rural households who live in a condition where their main source of food is at recurrent risk will develop self insurance coping mechanism in order to minimize risks to their household food security and livelihoods (Borton and Shohan, 1991). One of the coping mechanisms used by rural households to reduce fluctuations in income is manipulating the way in which their members allocate their time in pursuit of other means of earning a living or in diversifying their livelihood (IFAD, 2001). According to IFAD (2001) the degree of diversification depends on the resource constraints and institutional setting. In general, a greater the degree of diversification might lead households to cope with shocks to acquirement. Figure 2.4 conceptualizes the link between livelihood diversification and household food security by combining Scoones' (1998) sustainable livelihood framework and IFAD's (2001) food security framework.

Figure 2.4 Link between household livelihood strategy and food security



Source: Scoones' (1998) and IFADS's (2001)

Figure 2.4 shows the link that has been made to asses' livelihood diversification and food security by combining scoones' sustainable livelihood and IFAD'S food security frame works. It is evident that households prefer to use different livelihood strategies inorder to cope with shocks or to improve their food acquirement. According to figure 2.4, household food security can be negatively affected through shock to the level of food acquirement. In this case households might diverse their livelihood strategy to cope with the shock. On the other hand households might use livelihood diversification as a survival strategy. In both cases the major aim of the households is to improve the level of their food acquirement

through improving food availability and access. In this study income and food self sufficiency are used as an indicators of food security to see the effect of livelihood diversification on food availability and access.

2.2 Empirical Evidence on Food Security and Livelihood Diversification

2.2.1 The World Food Situation

The World Food Summit conducted in 1996, was mainly focusing on the situation of world food security. During the summit, WFP report indicates that after 30 years of rapid growth in agricultural production, the world can produce enough food to provide every person with more than 2700 calories per day (WFP, 2004). But not all regions and countries will share equally in these gains in production and nutrition. For instance, the situation in Africa south of the Sahara was expected to deteriorate further.

After two decades of this report, WFP (2004) reported that progress in developing countries toward reducing hunger had been slow in the past decade. This report has made the previous reports an approximate fact.

2.2.2 Food Security in Ethiopia

Ethiopia is Africa's second most populous country (CSA, 2008). It is an ancient land with roots stretching back to thousands of years, and characterized by distinct cultural and historical images. The human development index of UNDP in 2009 ranked this country 171 out of 182 countries. High rates of malnutrition, low primary education enrolment rates and a relatively small, though increasing HIV/AIDS prevalence, are all issues of concern for the government and humanitarian communities

Repeated famines leading to successive food shortage shade the whole picture of the country's food security context. This has been manifested in the prevailing chronic and

transitory food insecurity which has almost become the way of life of the majority population (Degefa, 2005). On the other hand the seriousness of food shortage problem varies from one region to another depending upon the state of the natural resource and the extent of development of the resource (Degefa, 2005).

According to Mesfin (1984), in northern central Ethiopia most farmers cannot produce enough food to meet the annual requirement. On the other hand, Degefa (1996) examines seasonal food shortages in Arsi Zone in which the region is to be considered as one of the place having surplus farm products at aggregate level. The study found 40% of households face seasonal food shortage, while farmers practicing double cropping face seasonal food deficit of 29% (Degefa, 1996).

Yared et al (2000) findings in south Wello came out with the region several factors resulting in severe food shortages and household food insecurity including drought, crop pests, population growth and diseases etc...

In order to find a long term solution to the problem, in 2004 the government with the active collaboration of a range of donors, designed a Food Security Programme (FSP) within the framework of Ethiopia's Poverty Reduction Strategy. The plan prepared and the interventions implemented are directed at improving the availability of and access to food and, to some extent, improving the health environment of targeted communities. Activities related to food access prioritise in helping households to diversify on-farm and off-farm source of income while efforts for greater productivity of cropping systems through expansion of irrigation and infrastructure will be attempted to increase the availability of food (FSCB, 2006).

2.2.3 Evidence on Diversification

Empirical evidence from a variety of different locations suggests that rural households do indeed engage in multiple activities and rely on diversified income portfolios. For instance, in Sub-Saharan Africa, 30-50 per cent, 80-90 per cent for southern Africa countries, and 60 per cent of southern Asia, rural farm households are reliant on non-farm income sources (Ellis, 1999). In Latin America, the average figure is slightly lower, at around 40 per cent (Reardon et al., 1997).

There is evidently a great deal of variation around these figures at the household level but a strong positive correlation between the proportion of household income obtained from non-farm sources and overall household income per capita has been observed in numerous studies (Ellis and Freeman, 2004). It is also attested that while diversity of income sources is prevalent across different income classes, the nature of this diversification differs greatly between better off and poorer households. The better off households tend to diversify in the form of non-farm business activities while the poor ones tend to diversify in the form of casual paid work, especially on other farms. As a result, diversification by the poor tends to leave them still highly reliant on agriculture; while that by the better off reduces such dependence (Ellis and Allison, 2004).

The way diversification patterns change across the income ranges is illustrated for a case-study of 344 rural households in Tanzania shown in table 2.1 below:

Table 2.1: Tanzania-income portfolios by income quartile (sample of 344 rural households, 2001)

Income Sources	Income Quartile				
	I	II	III	IV	Total
	n=87	n=88	n=88	n=81	n=344
Maize	27.1	21.5	15.1	7.9	12.4
Rice	12.3	14.2	10.3	8.8	10.0
Other Crops	23.3	19.9	23.8	11.8	16.3
Livestock	5.0	7.7	6.5	14.1	11.0
Sub-Total Agriculture	**67.7**	**63.3**	**55.7**	**42.6**	**49.7**
Wages	14.6	8.9	9.3	11.0	10.5
Non-Farm	11.5	23.7	29.3	44.0	36.1
Transfers	6.3	4.2	5.7	2.5	3.7
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Ellis & Allison (2004, p.6)

It can be observed that the relative dependence on agriculture declines across the income ranges from 68 per cent for the poorest quartile to 43 % for the rich. It is notable that the share of livestock in the income portfolio of the top quartile more than doubles compared to the bottom quartile, and the share of non-farm income quadruples from 11 to 44 % of the income portfolio. From this case study, it can be concluded that the attention paid by better off households to non-farm activities would result in the neglect and poor performance of their farming activities.

Note also that Table 2.2 below shows a cross-country sample of 1,355 households conducted in 2001 and 2002 of which the Tanzania example given above.

Table 2.2: Four countries-net farm output per ha, by income quartile (US$/ha)

Country	Income Quartile				Ratio IV: I
	I	II	III	IV	
Uganda	131	215	295	487	3.7
Kenya	135	266	358	430	3.2
Tanzania	81	108	156	381	4.7
Malawi	18	44	84	109	6.0

Source: Ellis & Allison (2004, p.6)

The above table shows that how agricultural productivity per hectare rises steeply across the income ranges. Net farm output per hectare rises steeply along with the income ranges and the rise was between three and six times higher for the top income quartile of households compared to the lowest income quartile. The result of this case study goes in line with Evans and Ngau (1991) conclusions. They referred that non farm income generates cash that can be used to improve farm yields by hiring labour and purchasing farm inputs. More broadly, a strong flow of non-farm income sources have been observed to bring environmental benefits, reversing environmental degradation and resulting in investment in improved soil and water management as well as in rising yields (Tiffen et al., 1994)

Chapter Three: Methodology

3.1 Selection of Study Area

There are 11 districts found in Wolaita Zone of which Sodo Zuria district is selected based on the availability of a relatively equal proportion of people leading their lives following diverse income portfolio and income earnings from primary enterprise only. On the other hand, the district is also known for its successive experience of food shortages for the past decades and food insecurity is being a common phenomenon that affects the lives of many people. The presence of an all weather road, the cooperativeness of the community and the districts administration are among the logistical considerations that were made.

The district is one of the highly populated areas of the zone constituting of 32 ***kebeles*** (Kebele Administration). From the 32 ***kebeles***, 4 ***kebeles*** are selected purposively based on their distance from the main city Sodo, the livelihood strategy, climate and topography. The selected ***Kebeles*** are Damot Waja, Buge Wanche, Wachega Busha and Kokate Mara Chare. Of these, Damot Waja and Kokate Mara Chare are the nearest ***kebeles*** to the city of Sodo. On the other hand, Buge Wanche and Wachega Busha are a bit farther away from the city and have hot and more arid type climatic condition, while Damot Waja and Kokate Mara Chare have colder climate with an average of higher altitude between 1740 m and 1900 m. While selecting these ***kebeles***, it is assumed that all of them have equal proportion of both strategies of livelihood, that is, livelihood diversification and intensification.

3.2 Sample Size Estimation

Assuming that the study determines continuous variable plays a greater role, the alpha level (acceptable risk, that the study is willing to accept, that the true margin of error exceeds the acceptable margin of error) is determined at 0.05, the acceptable error at 3%, on a seven point

scale to measure a continuous variable, and the estimated standard deviation of the scale being 1.167, according to Cochran's sample size formula shown below.

No = (T^2 * s^2)/d^2 = 120

Where t = value for selected alpha level of 0.025 in each tail = 1.96

S = estimate of standard deviation = 1.167

d = acceptable margin of error for mean which is estimated = 0.21(acceptable margin of error, points on primary scale = 7; acceptable margin of error = 0.03, 7 * 0.03 = 0.21)

- ✓ 120. households are selected from the four ***kebele***s.

3.3 Methods of Data Collection

The information needed entails the collection of different types of data using different types of methods. The data and the collection approaches were classified into two main types, namely quantitative and qualitative techniques and data types.

3.3.1Household Survey

This method was used in order to produce numerical or quantitative data using structured survey. The numerical data were used to estimate the following item:

Level of Livelihood Diversification: Livelihood diversification at the household level was calculated using the 'inverse Herfindahl-Hirschman diversity index' (labelled IHHD), equal to:

$$IHHD_i = \left(\frac{1}{\Sigma a_j^2}\right)$$

- ➢ Where a_j represents the proportional contribution of each livelihood activity

- ' j' represents livelihood activity and
- 'i' represents households overall income.

The maximum possible value of this index is the total number of different income sources, when and if total is distributed equally among each source (Ellis, 2000). The minimum possible value is one, which is attained when all income is obtained from one source only. We calculate the index for each household on the basis of its earned income only. In doing so, seven different categories of earned incomes are used based on the majority households involved.

Table 3.1 Income categories

no	Income group	no	Income group
1	Crop Cultivation	5	Traditional occupation such as carpentry, weaving, basket making, gold smith etc…
2	Agricultural labour	6	Livestock
3	CPR related such as collecting and selling non-timber forest products and forest labour	7	Sericulture
4	Trade/Self employed		

Effects of Diversification on Income

Table 3.2 Variables included in individual income regression

Variable name	Variable description
income	Total individual income, earned in the case of own cultivation. (Measured in logs)
age	Age of individual in years.
gender	Qualitative variable equal to one if individual is female, zero otherwise
household assets	Value of assets owned by households measured in livestock and area of land.
Member of households	Number of adults in household, defined as person aged 14 or over. Measured in logs
hhdv	Inverse Herfindahl-Hirschman diversity index
location	Distance form the city; distance more than 7 km, one; otherwise Zero

In order to determine the impact of livelihood diversification on income, the above information should be gathered through questionnaire which is analysed using the following econometric model.

$$\mathbf{Income}_i = a_0 + a_1(\ \mathbf{age}\ )_i + a_2(\ \mathbf{gender}\ )_i + a_3\ (\ \mathbf{hhassets}\ )_i + a_4\ (\ \mathbf{hhadults}\ )_i + a_5\ (\ \mathbf{hhdv}\ )_i + a_6\ (\ \mathbf{location}\ )_i + \mu$$

Where;

- a_0 = Constant (Change in income earned for every change of each variable)

- $a_1 - a_6$ = Magnitude and direction of each variable
- μ = Error

Each i indicates separate individuals. Our main interest lies in the sign and magnitude of the coefficients a_5. Each of the six variables is selected based on the assumption that every variable will significantly affect the income.

3.3.2 Focus Group Discussion

A single focus group discussion was conducted at the Agriculture and rural development bureau of Sodo Zuria District. The participants in the focus group discussion were identified by the extension agents working at the bureau rural development of the region. The selection of participants was based on satisfying heterogeneous characteristics of background in terms of livelihood and location representing all the four sample ***kebeles***.

3.4 Analysis of the Data

The data from the household survey questionnaires were entered into SPSS evaluation version 14 for analysis. In order to check the quality of the data entry, about 10% of the questionnaires were double-entered and different entries were compared to identify critical areas for re-checking. Regression was done by making use of SPSS.

Chapter Four: Results and Discussion

4.1 Setting of Sodo Zuria District

The district is the administrative centre of the Wolaita Zone of the Southern Nations, Nationalities, and People Region. Astronomically, the zone lies between 6054'N 37045'E6.90N37.750E with an elevation between 1600 and 2100 meters above sea level. The district administers 32 ***Kebeles*** with high population density of higher than average family size. Out of the total 32 ***Kebeles***, 4 ***Kebeles*** selected for this study are Damot Waja, Buge Wanche, Wachega Busha, and Kokate Mara Chare. In this ***Kebeles***, majority of the population livelihoods are based on agriculture and the activities in this sector use archaic and backward hand tools. Land ownership per household is on average 0.3 hectare. Furthermore there is environmental degradation caused by natural and man-made factors, loss of soil fertility, due to prolonged cultivation, which constitute the major problems, among other things, and result in low agricultural productivity and food deficiency (Save the Children, 2007)

4.2 Demographic and Economic Characteristics of Households being Surveyed

Table 4.1 Demographic and Economic Characteristics of Households being surveyed in percentage.

		Damot Waja	Buge Wanche	Kokate	Wachega
Gender of the head of the household	male	93.4	96.7	96.67	83.3
	female	6.6	3.3	3.33	16.6
Literacy of the head of the household	Literate	40.3	33.3	43.3	33.3
	Illiterate	59.7	46.7	56.6	66.6
Head of the household economic activity	Active	93.3	96.6	90	80
	Inactive	6.7	3.4	10	20
Number of permanent household members		6	5	7	7
Permanent household members economically active		4	4	5	3

According to Table 4.1, Wachega Busha has the greatest number of female headed household while Buge Wanche and Kokate Mara Chare have the lowest. In terms of literacy, head of the households found in Kokate are more literate while Buge Wanche and Wachega have the lowest literacy rate. On the other hand, head of the households that are found in Buge Wanche are more economically active with the lowest number of permanent household

members while households in Wachegas' head of households are highly inactive. And finally permanent household members that are found in Kokate are economically active while Wachega's are the lowest.

4.3 Household Food Self Sufficiency

Among food security indicators used in this survey is food gap, that is whether a household can cover its annual food consumption requirements or not. This is very important because the higher the number of months a household faces food gap, the more the household involves itself in coping strategy mechanisms in order to survive the deficit. About 91.7% of the sample population faced at least one month shortage of food. The prevalence of food gaps in the four ***kebele's*** can be observed from Table 4.2.

Table 4.2 Shortage of food in four selected ***Kebele's (N=120)***

Months of food shortage sampled households faced			***Kebele's***				Total
			Damot Waja	Buge Wanche	Wachega Busha	Kokate Mara Chare	
X < 1		N	0	5	1	4	10
		%	0	4.15	0.83	3.32	8.3
	No	N	30	25	29	26	110
		%	25	20.84	24.17	21.67	91.7
1 < X ≤ 4		N	16	20	9	18	63
		%	13.3	16.6	7.5	15	52.5
	No	N	14	10	21	22	67
		%	9.9	7	14.8	15.5	47.5
4 < X ≤ 8	Yes	N	10	5	17	8	40
		%	8.3	4.1	14.1	6.6	33.3
	No	N	20	25	13	27	80
		%	16.6	2.8	10.8	22.4	66.6
8 < X	Yes	N	4	0	3	0	7
		%	3.3	0	2.4	0	5.8
	No	N	26	30	27	30	113
		%	21.6	24.9	22.4	24.9	94.1

Among households that face such food gaps, 29.14% of them who cannot satisfy their annual food consumption from their own cultivation prefer to diversify their livelihood as a coping

strategy for the shock season. The rest of the households involve themselves in activities such as selling productive assets which undermines their livelihoods. When we compare each ***Kebele*** in terms of food self sufficiency, Buge Wanche and Kokate Mara Chare are relatively self sufficient than Damot Waja and and Wachega Busha.

According to the focus group discussion conducted with households found in each ***Kebeles***, they informed that the degree of severity of these activities depends on the duration of the food gaps. Generally, when facing such shocks and challenges, households tend to ease the situation by taking some measures, starting from eating less, reducing number of meals to selling livestock or even land.

4.4 Level of Livelihood Diversification

Out of a total 120 samples of units of households, 29.14% of the households follow diversified livelihood strategy as a short term response for crisis while 17.46 % of the households as a survival strategy. This level of diversification is distributed across ***Kebele's*** in Table 4.3.

Table 4.3 Level of Livelihood Diversification of each of the Selected Four ***Kebeles.***

Kebeles	Damot Waja	Buge Wanche	Wachega Busha	Kokate Mara Chare	**Total number of households and percentage with diversification**	**Total number and percentage of households**
Number of households	5	17	6	-	35	120
Level of short term diversification of each ***Kebele*** in percentage	4.16	14.163	4.99	5.832	29.14	100
Number of households	1	12	3	5	21	120
Level of long term diversification of each ***Kebele*** in percentage.	0.80	10	2.5	4.16	17.46	100

Depending on the time of shock, one is expected to sustain its food entitlement by creating its own mechanism by modifying its livelihood strategy based on conditions that best fits its current situation. The livelihood strategies range from reducing the unit and frequency of food consumption to selling productive assets. In order to find out what kinds of livelihood

strategies are most preferred by the households in the four ***Kebeles***, a survey was conducted among selected households of each ***Kebele***. As expected, livelihood diversification has a role in 29.14 % of the households as a short term response for crisis and 17.46% of the household for survival strategy, which makes it the second and the third most preferred livelihood strategy next to reducing the amount and frequency of food to be consumed, which is itself preferred by 50.42% of the rural farm households. When we rank these four ***Kebeles*** in terms of the number of households that follows diverse livelihood strategy, Buge Wanche is in the lead followed by Kokate Mara Chare, Wachega Busha and Damot Waja, respectively.

When we measure the level of livelihood diversification for each ***Kebele*** using the 'Herfindahl-Hirschman diversity index', the value differs as shown below:

Table 4.4 Mean Level of Livelihood Diversification of Damot Waja, Buge Wanche, Wachega Busha, Kokate Mara Chare

Kebeles	N	Mean household diversification index, measured in by IHHDV	Std. Deviation	Std. Error Mean
Damot Waja	30	1.0770	.18574	.03391
Buge Wanche	30	1.3237	.35726	.06523
Wachega Busha	30	1.1050	.25496	.04655
Kokate Mara Chare	30	1.1213	.27411	.05005

Although the level of diversifications of each ***Kebele*** is low compared to most other similar case studies conducted in different areas, for example, in rural Andhra Pradesh (India) and in Hai District of northern Tanzania (IHHD indices is in the range of 2.2-2.8) Ellis (2000), Buge Wanche and Kokate Mara Chare (1.32 and 1.12 IHHD respectively), follow diverse livelihood strategy. On the other hand, Damot Waja and Wachega Busha (1.07 and 1.10 IHHD respectively) are ***Kebeles*** where households are more specialized in that they follow less diverse livelihood strategy.

4.5 Comparison on the Level of Livelihood Diversification of Each *Kebele's*

In order to compare and conclude the effect of livelihood diversification on each selected ***kebele's*** mean earned income, it is important to know if their is a significant difference on their level of livelihood diversification. To this end, comparison was made between each ***kebele's*** levels of livelihood diversification, and the findings are shown in Table 4.5, 4.6, 4.7, and 4.8.

Table 4.5 Mean Difference in the Level of Livelihood diversification between Damot Waja and Buge Wanche.

Group Statistics

	kebele	N	Mean	Std. Deviation	Std. Error Mean
hosehold diversification index, measured in by IHHDV	damot	30	1.0770	.18574	.03391
	buge	30	1.3237	.35726	.06523

Table 4.6 Level of Significance in Mean Difference of Livelihood Diversification between Damot Waja and Buge Wanche.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
hosehold diversification inde measured in by IHI	Equal variance assumed	25.101	.000	-3.355	58	.001	-.24667	.07352	-.39382	-.09951
	Equal variance not assumed			-3.355	43.609	.002	-.24667	.07352	-.39486	-.09847

From Table 4.6, the significance of the two-tailed test shows the mean difference in livelihood diversification between Damot Waja and Buge Wanche is significantly different.

Table 4.7 Mean difference in the level of livelihood diversification between Damot Waja and Wachega Busha

Group Statistics

	kebele	N	Mean	Std. Deviation	Std. Error Mean
hosehold diversification index, measured in by IHHDV	damot	30	1.0770	.18574	.03391
	wachiga	30	1.1050	.25496	.04655

Table 4.8 Level of Significance in terms of Mean Difference in Livelihood Diversification between Damot Waja and Wachiga Busha.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
hosehold diversification inde measured in by IHI	Equal variance assumed	1.286	.261	-.486	58	.629	-.02800	.05759	-.14328	.08728
	Equal variance not assumed			-.486	53.016	.629	-.02800	.05759	-.14351	.08751

From Table 4.8 , the significance of the two-tailed test shows the mean difference in livelihood diversification between Damot Waja and Wachega Busha which is insignificantly different, since it is greater than 0.05.

Table 4.9 Mean Difference in the Level of Livelihood Diversification between Damot Waja and Kokate Mara Chare

Group Statistics

	kebele	N	Mean	Std. Deviation	Std. Error Mean
hosehold diversification index, measured in by IHHDV	damot	30	1.0770	.18574	.03391
	kokate	30	1.1213	.27411	.05005

Table 4.10 Level of Significance in terms of Mean Difference in Livelihood Diversification between Damot Waja and Kokate Mara Chare.

Independent Samples Test

		Levene's Test for quality of Variance		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	ig. (2-tailed	Mean Difference	Std. Error Difference	Lower	Upper
hosehold diversification inc measured in by I	Equal varian assumed	1.759	.190	-.733	58	.466	-.04433	.06045	-.16534	.07667
	Equal varian not assumed			-.733	50.993	.467	-.04433	.06045	-.16570	.07703

Table 4.10, the significance of the two-tailed test shows the mean difference in livelihood diversification between Damot Waja and Kokate Mara Chare is insignificantly different, since it is greater than 0.05.

Table 4.11 Mean Difference in the Level of Livelihood Diversification between Buge Wanche and Wachega Busha.

Group Statistics

	kebele	N	Mean	Std. Deviation	Std. Error Mean
hosehold diversification index, measured in by IHHD\	buge	30	1.3237	.35726	.06523
	wachiga	30	1.1050	.25496	.04655

Table 4.12 Level of Significance in terms of Mean Difference in Livelihood Diversification between Buge Wanche and Wachega Busha.

Independent Samples Test

		Levene's Test for uality of Variance		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	ig. (2-tailed	Mean Difference	Std. Error Difference	Lower	Upper
hosehold diversification inc measured in by I	Equal varian assumed	25.101	.000	-3.355	58	.001	-.24667	.07352	-.39382	-.09951
	Equal varian not assumed			-3.355	43.609	.002	-.24667	.07352	-.39486	-.09847

From the above table, one can see that the significance of two-tailed test shows the mean difference in livelihood diversification between Buge Wanche and Wachega Busha is significantly different.

Table 4.13 Mean Difference in the Level of Livelihood Diversification between Buge Wanche and Kokate Mara Chare

Group Statistics

	kebele	N	Mean	Std. Deviation	Std. Error Mean
hosehold diversification index, measured in by IHHDV	buge	30	1.3237	.35726	.06523
	kokate	30	1.1213	.27411	.05005

Table 4.14 Level of Significance in terms of Mean Difference in Livelihood Diversification between Buge Wanche and Kokate Mara Chare.

Independent Samples Test

		Levene's Test for quality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
hosehold diversification inde measured in by IHI	Equal variance assumed	.050	.823	-.239	58	.812	-.01633	.06835	-.15315	.12048
	Equal variance not assumed			-.239	57.698	.812	-.01633	.06835	-.15316	.12049

From the above table, the significance of the two-tailed test shows the mean difference in livelihood diversification between Buge Wanche and Kokate Mara Chare is insignificantly different, since it is greater than 0.05.

Table 4.15 Mean Difference in the Level of Livelihood Diversification between Wachega Busha and Kokate Mara Chare

Group Statistics

	kebele	N	Mean	Std. Deviation	Std. Error Mean
hosehold diversification index, measured in by IHHDV	wachiga	30	1.1050	.25496	.04655
	kokate	30	1.1213	.27411	.05005

Table 4.16 Level of significance in terms of mean difference in livelihood diversification between Wachega Busha and Kokate Mara Chare.

Independent Samples Test

		Levene's Test for quality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
hosehold diversification inde measured in by IHI	Equal variance assumed	.050	.823	-.239	58	.812	-.01633	.06835	-.15315	.12048
	Equal variance not assumed			-.239	57.698	.812	-.01633	.06835	-.15316	.12049

From the above table, the significance of the two-tailed test shows the mean difference in livelihood diversification between Wachega Busha and Kokate Mara Chare is insignificantly different, since it is greater than 0.05.

From the above results, it is found out that the mean level of livelihood diversification for Buge Wanche is significantly different and higher than those of the other ***kebeles*** except for Kokate Mara Chare, while the mean difference of the others is insignificant. As a result, this finding suggests that the ***kebeles*** can be stratified into two groups as Buge Wanche and Kokate Mara Chare with diverse livelihood strategy, and, Damot Waja and Wachega Busha with less diverse livelihood strategy. This is done in order to make a comparison of their level of income and food security status.

Generally in terms of both level and significant mean difference of livelihood diversification, stratification can be made of the four ***kebeles*** as Buge Wanche and Kokate Mara Chare (1.32 and 1.12 IHHD respectively) with higher level of livelihood diversification and Damot Waja and Wachega Busha (1.07 and 1.10 IHHD respectively) showing lower livelihood diversification.

4.6 Effect of Livelihood Diversification on Income Earned from Own Cultivation

Since income earned from own cultivation significantly determines a household's food availability, it is found necessary to consider the effect of livelihood diversification on household income earned from own cultivation. In order to do this regression is used. The result is shown in Table 4.17.

Table 4.17 Model summary for the regression

Mode	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.684(a)	.468	.444	.29220

(A) Predictors: (Constant), number of adults in households, household diversification index, measured in IHHDV, where qualitative variable is equal is to one if individual is female, and zero if individual is male, age of the head of household stated in years, and value of assets owned by household. Two different types of assets are distinguished and land and livestock are measured in logs.

(B) Dependent Variable: Total household income earned in the case of own cultivation measured in logs.

Table 4.18 Coefficients for the regressed model

Mode	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta	B	Std. Error
(Constant)	2.514	.184		13.670	.000
Age of the head of the households, in years	.006	.002	.191	2.620	.010
Qualitative variable equal to one if individual is female, and zero if individual is male.	-.205	.082	-.174	-2.500	.014
Household diversification index, measured in IHHDV value of asset owned by households.	.414	.097	.305	4.284	.000
Two different types of assets distinguished, land and livestock measured in logs.	.483	.065	.547	7.410	.000
Number of adults economically active	-.022	.016	-.099	-1.395	.166

According to the regression result in Table 4.18, the head of the household's literacy and value of assets have a positive effect on earning, while these have negative effect on female-headed households with a large number of adult members. This means that many of the households are individual-based, and those that own more land or assets, or have less adult members have relatively higher earnings. The most important finding is that diversification is found to increase the level of income earned from own cultivation, and this result is statistically significant at 5%. This can be interpreted as an increase in the household IHHD index of one unit (a change from one single source of household income to two equal income sources) will increase the income earned from own cultivation by 41.4 %. As a result, it provides an opportunity for farm households to increase access and availability of food.

The other most important result found from the focus group discussion conducted with households found in each ***Kebeles*** is, farmers usually conduct non- farm activities not only to fill in the food gap that they face during a period of shock but also to purchase different agricultural inputs such as fertilizers and pesticides. As a result, households who are able to diversify their livelihood have better income earnings from their own cultivation and this result is proved based on the above model. This model shows the positive value and the magnitude of diversification index measured in IHHDV.

It is also crucial to note the chart and the distribution of the observations around the mean in order to be sure about the reliability of the model.

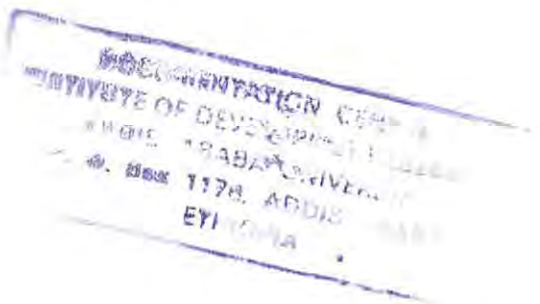
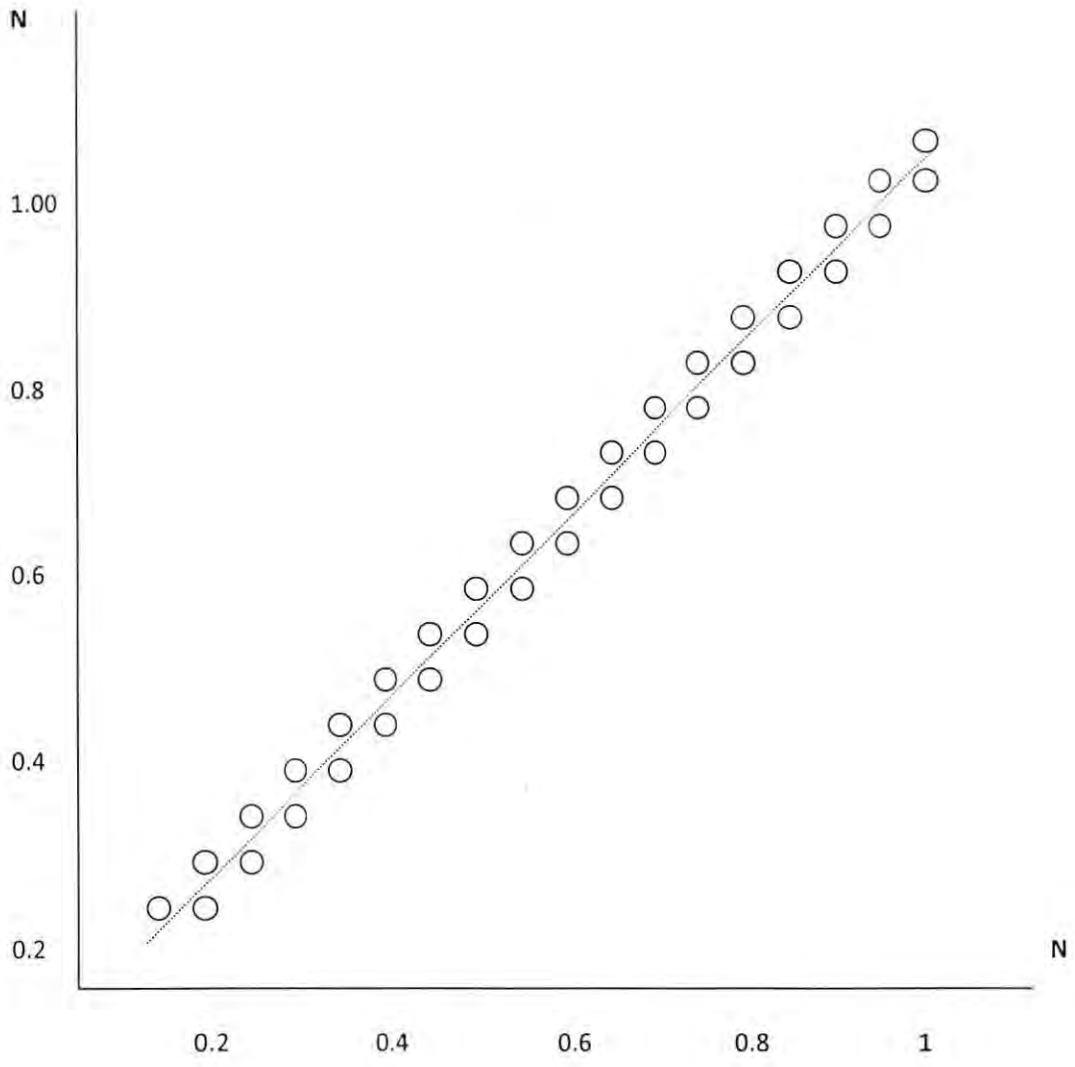


Figure 2.5 Linear distributions around the mean

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: Total Household income earned in the case of own cultivation measured in logs.

Independent Variable: Livelihood Diversification Index



4.7 Correlation between Household Livelihood Diversification and Income Earned from Own Cultivation

Correlating the two variables, that is, household livelihood diversification and income imputed from own cultivation, will give us clear information on the two variables as to whether they are significantly correlated or not. Table 4.22 shows this correlation between the two variables.

Table 4.19 Correlation between household livelihood diversification and household income imputed from own cultivation

Correlations

		total household income imputed in the case of own cultivation measured in logs	hosehold diversification index, measured in by IHHDV
total household income imputed in the case of own cultivation measured in logs	Pearson Correlation	1	.212*
	Sig. (2-tailed)		.020
	N	120	120
hosehold diversification index, measured in by IHHDV	Pearson Correlation	.212*	1
	Sig. (2-tailed)	.020	
	N	120	120

*. Correlation is significant at the 0.05 level (2-tailed).

According to table 4.19, although there is 21.2% positive correlation between income earned from own cultivation and livelihood diversification, the strength of its correlation value is low.

4.8 Comparison of Income Earned from Own Cultivation by Each *Kebele*

From the above results, it is clear that income earned from own cultivation is significantly affected by the way households are leading their livelihood. This leads to the mean difference

on income from own cultivation between the four ***kebeles*** selected. Tables 4.20, 4.21, 4.22, 4.23, 4.24, and 4.25 show the detail of the results.

Table 4.20 Mean income difference from own cultivation between Damot Waja and Buge Wanche.

	Kebele	N	Mean	Std.Deviation	Std.Error Mean
Total household earned income in the case of own cultivation	Damot Waja	30	1210.59	0.24131	0.04406
	Buge Wanche	30	3608.27	0.45778	0.8358

Table 4.21 Level of significance of mean income difference from own cultivation between Damot Waja and Buge Wanche

Independent Samples Test

		Levene's Test for quality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
total household income imputed in case of own cultiva measured in logs	Equal variance assumed	13.364	.001	-5.020	58	.000	-.47433	.09448	-.66346	-.28521
	Equal variance not assumed			-5.020	43.961	.000	-.47433	.09448	-.66475	-.28392

As it can be observed from the above two tables, mean income for Damot Waja is significantly different from that of Buge Wanche. And the mean income from own cultivation of Buge Wanche 3608.27 Birr is higher than that of Damot Waja 1210.59 Birr.

Table 4.22 Mean income difference from own cultivation between Damot Waja and Wachega Busha

	Kebele	N	Mean	Std.Deviation	Std.Error Mean
Total household earned income in the case of own cultivation	Damot Waja	30	1210.59	0.24131	0.4406
	Wahchega Busha	30	2794.47	0.36146	0.6599

Table 4.23 Level of significance of mean income difference from own cultivation between Damot Waja and Wachiga Busha

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
total household income imputed in tl case of own cultivat measured in logs	Equal variance assumed	2.521	.118	-4.579	58	.000	-.36333	.07935	-.52216	-.20450
	Equal variance not assumed			-4.579	50.566	.000	-.36333	.07935	-.52266	-.20400

From the above two table, it is evident that the mean income of Damot Waja is significantly different from that of Wachega Busha. And the mean income from own cultivation of Wachega Busha 2794.47 Birr is significantly higher than that of Damot Waja which is 1210.59 Birr.

Table 4.24 Mean income difference from own cultivation between Damot Waja and Kokate

	Kebele	N	Mean	Std.Deviation	Std.Error Mean
Total household earned income in the case of own cultivation	Damot Waja	30	1210.59	0.24131	0.04406
	Koate Mara Chare	30	3650.50	0.27125	0.4952

Table 4.25 Level of significance of mean income difference from own cultivation between Damot Waja and Kokate Mara Chare

Independent Samples Test

		Levene's Test for quality of Variance		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	ig. (2-tailed	Mean Difference	Std. Error Difference	Lower	Upper
total household income imputed i case of own culti measured in logs	Equal varian assumed	.582	.449	-7.232	58	.000	-.47933	.06628	-.61201	-.34665
	Equal varian not assumed			-7.232	57.224	.000	-.47933	.06628	-.61205	-.34661

Again the mean income of Damot Waja, which is 1210.59 Birr, is significantly lower than that of Kokate Mara Chare which is 3650.05 Birr.

On the other hand, the mean difference of income earned from own cultivation by Buge Wanche and Wachega Busha, Buge Wanche and Kokate, and Wachega Busha and Kokate is insignificant. (See the detail in appendix B)

In the above section of the discussion, we have stratified the ***Kebeles*** into two groups in order to make the analysis easier. The first group includes both Buge Wanche and Kokate Mara

Chare whereas the second group includes Damot Waja, Wachega Busha. As the finding in Table 4.4 shows, Buge Wanche has significant mean difference of diversification compared to Damot Waja and Wachega Busha while, in Table 4.20 and 4.21, the finding shows the mean difference in income earned from own cultivation is only significant with Damot Waja but not with Wachega Busha. This means that the mean difference in income earned from own cultivation between Buge Wanche and Damot Waja results from the mean difference in livelihood diversification. On the other hand, the mean difference in income earned from own cultivation between Buge Wanche and Wachega Busha is not caused significantly by to the mean difference in livelihood diversification. On the contrary, although the level of livelihood diversification in Kokate Mara Chare is greater than that of Damot Waja and Wachega Busha, its significance in mean difference is low. Generally, it can be concluded that the income gap arising from own cultivation between Damot Waja and Buge Wanche is due to the positive effect of livelihood diversification on income from own cultivation and that this might result in better opportunities for the households of Buge Wanche to attain a higher level of access to and availability of food when compared to Damot Waja.

4.9 Comparison of Total Income Earned by Each *Kebele*

Just the same as in the mean income earned from own cultivation, each kebele's income also differs in the total income earned. This difference is found to be significant between Damot Waja and Buge Wanche, Damot Waja and Wachega Busha. Damot Waja and Kokate Mara Chare, and Buge Wanche and Wachega Busha. On the other hand, Buge Wanche and Kokate Mara Chare, as well as Wachega Busha and Kokate Mara Chare have insignificant total income differences. (See the detail in Appendix two)

Table 4.26 Mean total income difference between Damot Waja and Buge Wanche

Group Statistics

	KEBELE	N	Mean	Std. Deviation	Std. Error Mean
total income	Damot Waja	30	1465.1667	674.28568	123.10716
	Buge Wanche	30	9696.0333	12684.46712	2315.85626

Table 4.27 Level of significance of mean total income difference between Damot Waja and Buge Wanche

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
total income frc own cultivation	Equal variance assumed	27.541	.000	-4.007	58	.000	4639.467	157.8171	-6957.09	-2321.84
	Equal variance not assumed			-4.007	29.528	.000	4639.467	157.8171	-7005.63	-2273.30

The mean income earned by Buge Wanche is significantly higher than that of Damot Waja.

4.28 Mean Total income difference between Damot Waja and Wachega Busha

	Kebele	N	Mean	Std. Deviation	Std. Error Mean
Total income	Damot Waja	30	1393.8333	602.36414	109.97614
	Wachiga Busha	30	3829.3833	3331.96727	608.33121

Table 4.29 Level of significance of mean total income difference between Damot Waja and Wachiga Busha

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
total income frc own cultivation	Equal variance assumed	12.567	.001	-3.940	58	.000	-2435.550	618.19221	-3673.00	-1198.10
	Equal variance not assumed			-3.940	30.894	.000	-2435.550	618.19221	-3696.54	-1174.56

The mean income earned by Wachega Busha is significantly higher than that of Damot Waja

Table 4.30 Mean total income difference between Damot Waja and Kokate Mara Chare

Group Statistics

	KEBELE	N	Mean	Std. Deviation	Std. Error Mean
total income	Damot Waja	30	1465.1667	674.28568	123.10716
	Kokate Mara Chare	30	5178.3333	4244.06325	774.85639

Table 4.31 Level of significance of mean total income difference between Damot Waja and Kokate Mara Chare

Independent Samples Test

		Levene's Test for quality of Variance		t-tes: for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	ig. (2-tailed	Mean Difference	Std. Error Difference	Lower	Upper
total income fi own cultivatio	Equal varianc assumed	22.145	.000	-5.310	58	00	3107.233	85.18128	4278.60	1935.87
	Equal varianc not assumed			-5.310	31.121	00	3107.233	85.18128	4300.53	1913.94

The mean income earned by Kokate Mara Chare is significantly higher than that of Damot Waja.

Table 4.32 Mean total income difference between Buge Wanche and Wachega Busha

Group Statistics

	Kebele	N	Mean	Std. Deviation	Std. Error Mean
total income	Buge Wanche	30	9696.03 33	1268.46712	2315.85626
	Wachiga Busha	30	4529.38 33	4402.69537	803.81852

The mean income earned by Buge Wanche is significantly higher than that of Wachega Busha.

As can be observed from Table 4.26 and 4.32, Buge Wanche's mean total earned income significantly differs from that of Damot Waja and Wachega Busha. The same ***Kebele*** again has a significant mean difference of diversification compared to the above two ***Kebele's***. This

can be interpreted that there is a mean difference in total earned income between Buge Wanche versus Wachega Busha and Damot Waja which results from the mean difference in livelihood diversification. On the other hand, the mean difference in livelihood diversification between Kokate Mara Chare and Damot Waja does contribute to the mean difference in the total earned income between them. But Mean difference in livelihood diversification between Kokate Mare Chare and Wachega Busha does not contribute to the mean difference in total earned income between them. Generaly, this discussion leads us to a possible conclusion that the income gap created between Buge Wanche versus Damot Waja and Wachega Busha as well as between Kokate Mara Chare and Damot Waja is a result of positive effect of livelihood diversification and this might provide good opportunities for the household of Buge Wanche when compared with Damot Waja and Wachega Busha, and Kokate Mara Chare when compared with Damot Waja, in terms of sustaining their food access all year round.

4.10 Correlation between Household Livelihood Diversification and Income Earned from Own Cultivation

One of the mechanisms for knowing the causal effect of difference in income is correlating the livelihood strategy with the total income earned. In this study, the effect of household livelihood diversification on total income is shown by the correlation of the two variables, which is shown in the following table.

Table 4.33 Correlation between livelihood diversification and total earned income

Correlations

		hosehold diversification index, measured in by IHHDV	total income
hosehold diversification index, measured in by IHHDV	Pearson Correlation	1	.509**
	Sig. (2-tailed)		.000
	N	120	120
total income	Pearson Correlation	.509**	1
	Sig. (2-tailed)	.000	
	N	120	120

**. Correlation is significant at the 0.01 level (2-tailed).

According to table 4.33, there is a strong correlation between livelihood diversification and total income unlike total income earned from own cultivation and livelihood diversification.

In addition the total earned income is significantly and positively correlated at 0.01% with livelihood diversification. This gives us clues towards a conclusion that livelihood diversification can lead to an increment in house hold total earned income.

Chapter Five: Conclusion and Recommendation

5.1 Conclusion

The objective of this study was to explore the effect of livelihood diversification on the food security status of farm households, and to compare the availability and access of food between households with more and less diversified livelihood strategy.

Looking at the level of food security status, a study area was identified on the basis of vulnerability to seasonal food shortage. The majority of the households in the area cannot sustain themselves a whole year with the amount of food they acquire. In order to identify whether the livelihood strategy households used to sustain and secure food availability is effective as its objective, qualitative and quantitative data were used. The data are gathered using survey questionnaires, and focus group discussions. Based on the data gathered, the levels of diversification are identified for each selected Kebeles, and stratification of the villages is employed in order to see whether the effect of the livelihood strategy they follow has effect on their ability to acquire food.

It was found out that households' livelihood strategy is highly dependent on the coping mechanism they prefer to use. One of the mechanisms they preferred is diversifying livelihood portfolio which allows them to gain additional source of income. But the level of preference between two coping strategies significantly differs across the four selected ***Kebeles.*** Households that are found in Buge Wanche and Kokate Mara Chare prefer to diversify their livelihood more than the other households in the other selected ***Kebeles***.

Based on the livelihood strategy they follow, comparison was made in order to identify which livelihood strategy has more impact on increasing the level of food access and availability for each household. It was found out that those households with higher level of diversification

have more opportunities in increasing the level of own farm income as well as in the total income earned.

On the other hand, when we look at the ***Kebele*** level, Buge Wanche and Kokate Mara Chare were found to be higher in the size of households that prefer to diversify livelihood as a coping strategy and show a higher mean level of diversification compared to the other ***Kebeles***. We also compared the mean income level of the households and this ***Kebele*** was again found to have more mean income than the rest of the ***Kebeles.***

Generally, livelihood diversification helps to lessen the vulnerability of the poor to food insecurity and livelihood collapse, provide the basis for building assets that permit individuals and households to find their own way out of poverty, and widens their options and encourages spatially diverse transactions which increase money circulation in rural areas.

5.2 Recommendation

This study takes the view that is supported by considerable literature and empirical evidence that livelihood diversification is generally a good approach to reducing food insecurity and rural poverty as a whole. But the essential factor of this approach is determined by different factors that might inhibit the strategy to be more effective for the rural poor.

According to an asset-based view of the cause of diversification, it is expected there is to be an 'inverse- U' shaped relationship between the amount of land owned by a household and the level of livelihood diversification. For example, a household which owns lots of land relative to its labor power specialize in cultivation, while household which own very little or no land relative to its labor power specialize in wage labor. And a household which posses some land but not enough to fully employ the household labor supply, derive its income both from own cultivation and wage labor. Based on this view, our study site (Damot Waja, Wachega Busha, Buge Wanche, and Kokate Mara Chare) can be categorized under

households having some land but not with enough labor supply. Even though the level of asset and the amount of household labor supply should be leading to livelihood diversification, the level of diversification in Wachega Busha and Kokate Mara Chare is low.

On the other hand, households those are found in Buge Wanche and Kokate Mara Chare have a relatively better level of livelihood diversification with higher level of income earned from own cultivation, total earned income and slightly better food self sufficiency. In addition, based on the regression result conducted, diversification has positive contribution to earned income from own cultivation. In general household who diversify its livelihood has better access and availability to food.

As a result policies which help reduce factors that might inhibit livelihood diversification such as, society's inability to be mobile, unfair distribution of assets, unequal chance of accessing natural resource etc..., are likely to lift more households in having better opportunity of food access and availability in this region.

On the other hand, Understanding each specific causes of livelihood diversification and knowing the barriers that households face to diversify their livelihood is an important task for further research.

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Appendix A

A-Household Survey Questionnaire

Part One: Characteristics of the household

1.1 Basic Information Regarding Household

1. Date _____		Choice No
2. Kebele		
3. Head of the household	1. Male 2. Female	
4. Marital Status	1. Single 2. Married 3. Divorced 4. Widow 5. Separated	
5. Literacy	1. Literate 2. Illiterate	
6. Is the head of the household economically active?	1. Yes 2. No	
7. If your answer for questionnaire n.6, is no, why?	1. Sickness 2. Old age 3. Physically impaired 4. If Other, describe _____	
8. Number of Adults in the household?	1. Male____ 2. Female____ 3. Total____	Age 1. Male____ 2. Female____
9. How many of the adult household members are economically active?	_____	

Part two: Access Resource, Labour, Agricultural input, and Social Network

2.1 Information Regarding Access to Resources

1. Do you have a cultivation land? 1. Yes_____ 2. No _____

2. If your Answer for Question number 1 is yes, how did you get it?

_____

_____

_____

3. Area coverage of your land?

Type of land use	Coverage in Timad	Coverage in Hectare
1. Cultivated land		
2. Uncultivated land		
3. Range land		

4. Your land coverage since the past five years has

1. Increased_____ 2. Decreased _____ 3. Not Changed _____

5. If your answer for question number 4 is yes, why?

_____

_____

_____

6. How much total yield did you get from this year cultivation?

_____

_____

_____

7. How would you describe the fertility of your land?

Colour

1. Red _____
2. Black _____
3. Brown _____

Fertility

1. Good _____
2. Medium _____
3. Bad _____

8. Did you share cropped this year?

1. Yes _____

2. No _____

9. If your answer for question number 8 is yes, why?

_____

_____

_____

10. How much yield did you get from the share cropping?

_____

_____

_____

11. Is there a communal land that you use in your community?

1. Yes _____

2. No _____

12. If your answer for question number 11 is yes, for what purpose do you use this resource?

1. _____

2. _____

3. _____

2.2 Access to Labour

1. Who is involved in cultivation?

1. Household labour _____

2. Friends or relatives _____

3. Temporary wage labour _____

4. Permanent wage labour _____

5. If any other describe _____

2. Who is involved in livestock rearing?

1. Household labour

2. Friends or relatives _____

3. Temporary wage labour _____

4. Permanent wage labour _____

5. If any other describe _____

2.3 Access to Agricultural Extension Package

1. How many times has your household received agricultural input package from development agent, starting from last year?

_____

2. On what basis did you received the agricultural extension Package?

1. Immediate payment _____

2. Loan _____

3. If your answer for question number 2 is loan, how is the loan repayment situation?

1. Have just finished paying _____

2. Half of the loan is paid _____

3. Payment period has not reached yet _____

4. It has been difficult for me to pay my loan _____

4. For what purpose did you received the agricultural extension package?

_____

_____

_____

5. If you are not using any of the agricultural extension packages, what is your reason?

_____

_____

_____

2.4 Social Relation and Net Working

1. In what kind of community activities do you participate?

_____

2. What is the purpose of the community activity?

_____

Part Three: Livelihood Strategy, Productivity, Formal and Informal Transfer

3.1 Livelihood Strategy and Productivity

1. Describe the amount of yield you gained from this year production.

No	Type of plant cultivated	Belg season cultivation		Meher season cultivation	
		Area coverage	Productivity in Kuntal	Area coverage	Productivity in Kuntal
1					
2					
3					
4					
5					
6					
7					
8					
9					

2. Describe the amount of Livestock you own.

Type of Livestock	Number	Amount in Birr
Oxen		
Cow		
Sheep		
Goat		
Horse		
Donkey		
Hen		
Bee hives		

Others _____ _____ _____	

3.2 Income earned from non-farm activity

1. Is their any adult permanent household member involved in activities other than agriculture?

1. Yes _____

2. No _____

2. If your answer for question number one is yes, in what kind of economic activities are you/ your household member is involved? How much income you/ your household member earned? For what purpose you/ your household member used the income earned?

A.

No Type of activity	No of household involved in economic activities other than agriculture	How many of the months you/your household member are involved in economic activities other than agriculture	In average, how much money did you/your permanent household member received in a year	
			In Birr	Estimated in Birr, if receive in other type of arrangement
1				
2				
3				
4				
5				

B. For what purpose you/ your permanent household member used the income earned from economic activities other than agriculture?

First	Second	Third

3.3 Informal Transfer

1. For the past 12 moths, had your family received food or money in terms of gift?

    1. Yes _____

    2. No _____

2. If your answer for question number one is yes, from who did you received this gift?

    1. from my son/daughter living in the city _____

    2. from my parents _____

    3. from my relatives _____

    4. from my friends _____

    5. Others _____

    _____

    _____

3.4 Formal transfer

1. For the past 12 moths, had your family received aid from government or non-government organisations?

    1. Yes _____

    2. No _____

2. If your answer for question number 1 is yes, from which government or non- government organization did you received aid?

Government Organisation Non- Government Organization

Name: _____ _____

_____ _____

_____ _____

Part Four: Food Security

3.1 Type of food consumed in a year

Type of food consumed	Amount in Kuntal or Killo Gram	Amount Converted into Birr
1. Types of cereals including Teff _____ _____ _____ _____ _____		
2. Types of tuber Plants _____ _____ _____		

_____ _____		
3. Types of vegetables _____ _____ _____ _____		
4. Types of Fruits _____ _____ _____ _____ _____		
5. Meat products _____ _____ _____ _____		

_____	
6. Dairy products _____ _____ _____ _____ _____	

1. Is your household yearly food consumption can be satisfied with the amount of grain you produce?

1. Yes _____

2. No _____

2. If your answer is No for question number 1, how many of the months in average, your own cultivation can satisfy the food demand of your family?

_____

3. If you have income earned other than agricultural activity, does it satisfy to purchase the food demand of your family during a food gap?

1. Yes _____

2. No _____

3. If your answer for question number 3 is no, why?

_____

_____

_____

4. Based on your own personal perspective do you believe that your family is food secured?

1. Food is secured _____

2. Food is not secured _____

3. Food is sometimes secured and sometimes is not secured _____

5. If your answer for question number 4 is 2, what do you think is the reason?

_____

_____

_____

Part Five: Coping Strategy

Coping Strategy	Yes	No	Coping strategy	Yes	No
1. We reduced the amount of food we consume	1	2	We rented our land	1	2
2. we start eating food usually we do not prefer to eat	1	2	We sold our land	1	2
3. Friends and relatives helped us	1	2	We diversified our income source	1	2
4. Our family members migrated to another places	1	2	We sold our assets such jewelleries	1	2
5. We borrowed food or money	1	2	**If any other:** _____ _____		
6. We reduce our expenses other than food	1	2			

Part Six: Main points for the Focus Group Discussion

1. Main annual crops grown and size of harvests during last two seasons.

2. Trends in production.

3. Types of technological inputs under use.

4. Possession of farm equipment's and home utensils.

5. Non-farm activities that the head and other members under take.

6. Income from non-farm activities and purpose for which the money is used.

7. Benefits from safety-net schemes.

Appendix B

Mean difference of income earned from own cultivation by Buge Wanche and Wachega Busha, Buge Wanche and Kokate, and Wachega Busha and Kokate.

Group Statistics

	kebele	N	Mean	Std. Deviation	Std. Error Mean
total household income imputed in the case of own cultivation measured in logs	buge	30	3.5573	.45778	.08358
	wachiga	30	3.4463	.36146	.06599

Independent Samples Test

		Levene's Test for Equality of Variance		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
total household income imputed in the case of own cultivation measured in logs	Equal variances assumed	3.208	.078	1.042	58	.302	.11100	.10649	-.10217	.32417
	Equal variances not assumed			1.042	55.039	.302	.11100	.10649	-.10241	.32441

Group Statistics

	kebele	N	Mean	Std. Deviation	Std. Error Mean
total household income imputed in the case of own cultivation measured in logs	buge	30	3.5573	.45778	.08358
	kokate	30	3.5623	.27125	.04952

Independent Samples Test

		Levene's Test for Equality of Variance		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
total household income imputed in the case of own cultivation measured in logs	Equal variances assumed	9.080	.004	-.051	58	.959	-.00500	.09715	-.19947	.18947
	Equal variances not assumed			-.051	47.129	.959	-.00500	.09715	-.20043	.19043

Group Statistics

	kebele	N	Mean	Std. Deviation	Std. Error Mean
total household income imputed in the case of own cultivation measured in logs	wachiga	30	3.4463	.36146	.06599
	kokate	30	3.5623	.27125	.04952

Independent Samples Test

		Levene's Test for quality of Variance		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
total household income imputed in case of own cultiva measured in logs	Equal variance assumed	.923	.341	-1.406	58	.165	-.11600	.08251	-.28116	.04916
	Equal variance not assumed			-1.406	53.798	.165	-.11600	.08251	-.28143	.04943

Appendix - C

A) List of respondents in the focus group discussion

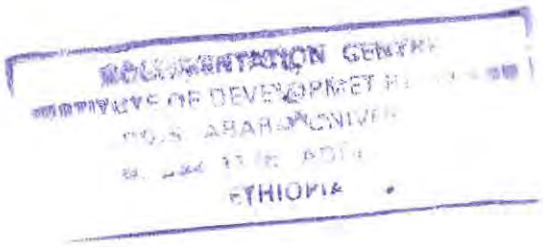
No	Name	Sex	Age	Kebele
1	Chufalo Dengato	Male	48	Buge Wanche
2	Elias Gergo	Male	38	Buge Wanche
3	Tediko Tema	Female	39	Damot Waja
4	Tekle Tantu	Male	38	Damot Waja
5	Keremo Maleta	Male	38	Kokate Mara Chare
6	Yeshi Tella Banga	Female	44	Kokate Mara Chate
7	Endria Baza	Male	47	Wachiga Busha
8	Bergene Banga	Male	27	Wachiga Busha
9	Wintana Seifu	Female	24	Employee in the rural development bureau
10	Amanuel Fanta	Male	27	Extension worker

B) Respondent for the key informant interview ---- Food security officer of the rural development bureau.

DECLARATION

I, the undersigned, declare that this thesis is my original work and that all sources of materials used for the thesis have correctly acknowledged.

NAME	SIGNATURE	DATE
Tsegazeab Baye	_____	_____



The Thesis has been approved for submission by:

NAME OF SUPERVISOR	SIGNATURE	DATE
Dr. Degefa Tolosa	_____	_____