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**LIVELIHOOD DIVERSIFICATION AND
FOOD SECURITY AMONG PERIURBAN
HOUSEHOLD: THE CASE OF HORO
WOREDA OROMIA NATIONAL REGIONAL
STATES, ETHIOPIA**

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LIVELIHOOD DIVERSIFICATION AND FOOD SECURITY AMONG PERIURBAN HOUSEHOLD: THE CASE OF HORO WOREDA OROMIA NATIONAL REGIONAL STATES, ETHIOPIA

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ABSTRACT

Purpose: This study aimed to assess the livelihood diversification and food security among peri urban households the case of Horo districts.

Methodology: Multi stage sampling techniques was used to selected sample respondents. Four peri urban Kebele were randomly selected based on 10 km radius of the Shambu and Sekela towns out of the existing 22 Kebeles. Based on proportional sampling size 146 respondents were selected. Data was collected using key informant interview, focus group discussion and interview schedule. Both descriptive and econometric data analysis techniques were applied.

Results: The descriptive statistical revealed that human capital variables: family size, educational level, age, sex, and land size. Binary logistic regression model result indicates that educational level, land size livelihood diversification have significant and positive influence household food security. Whereas household age, sex, frequency of extension agents contact, use of agricultural technologies and market distance has significant negative influence of household food security in the study area at different significant levels. The man identified constraints these households encounter with various livelihood to meet household needs lack of assets, loss of farm lands for housing purposes and unfavorable climate conditions. The result also indicates that 24.65% of households interviewed have food insecurity

Unique contribution to theory, practice and policy: Food security situation with in the study area there is not chronic problems as historical but there are bad situations. There is towards their assertion is that they focused only on food availability without touching to access and use. They have implemented policies including food security demonstration to help recover the situation.

Keywords: *Livelihood, Diversification, food security, periurban household*

1.0 INTRODUCTION

1.1 Background of the Study

Ethiopia has estimated population of 90 million of which about 83% are rural population (CSA, 2013). The agricultural sector plays an important role in the national economy, livelihood and socio-cultural system of the country. The sector supports employment of over 80% of the population and accounts for 45 to 50% of the national Gross Domestic Product (GDP) (Berhanu, 2006). Diversification of income sources, assets, and occupations is the norm for individuals or households in different economies, but for different reasons (Adugna, 2005). Despite the traditional believes that view rural non-farm sector as a low productivity sector, recent years have witnessed a shift away from this position towards (Lanjouw & Lanjouw 1995). Ecological and environmental influence due to human developmental activities has been steadily increasing and causing unprecedented magnitude and rate of global ecosystem change. The rural poor have developed the capacity to cope with increasing vulnerability associated with agricultural production - diversification, intensification and migration or moving out of farming (Ellis, 2000).

Livelihood strategies are the combination of activities that people choose to undertake in order to achieve their livelihood goals. Rural people partake in a number of strategies, including agricultural intensification, and livelihood diversification, to attain their livelihoods goal. However, the contribution to be made by livelihood diversification to rural livelihoods has often been ignored by policy makers who have chosen to focus their activities on agriculture (Carswell, 2000). Understanding what factors have led to livelihood change was an important on-going question in the research, particular factors affecting agricultural and non-agricultural opportunities, and the need to manage livelihood portfolios in relation to risk.

However, rural livelihoods bordering on subsistence comprise complex mechanisms. Constraints are many and can have adverse consequences. Possibilities are few and not always attractive. Impacts are hard to predict and planning is often impeded. Choices and necessities within livelihood strategies are likely to be a result of the level of household poverty. Resources, assets, savings, capabilities and skills are of significance in this equation. So are a number of other factors. When struggling for subsistence, fulfillment of the most basic needs might be the main priority and hence what motivates the actions taken. Comprehending the complex mechanism of such livelihoods seemingly needs to depart from the establishment of food security status. Since the prevalence of food security is uneven in Ethiopia, as in many other countries, a case study is indispensable to such an analysis. From the establishment of the food security status in a particular case, the livelihood activities can be detected and the relation between these livelihood characteristics can be analyzed, allowing for the unraveling of the motivation for livelihood diversification. In this manner it will appear whether the livelihood activities are reflected by the food security status. Also, this will suggest whether the livelihood activities are reflected in the food security status, and whether livelihood diversification is a suitable means for reducing poverty and improving food security. Thus, a thorough understanding of alternative livelihood strategies of rural households and communities is indispensable in any attempt to bring improvement. This is important not to commit a limited resource available for rural development based on untested assumption about the rural poor and its livelihood strategies (Tesfaye, 2003).

Understanding the local context of household livelihoods is not only necessary to ensure appropriate development strategies, but also as a basis for monitoring and evaluation, and a

means of assessing potential for replication in other contexts. Therefore, a thorough understanding of factors influencing livelihood diversification is indispensable in any attempt to bring improvement and not to commit a limited resource based on untested assumption about the rural poor and its livelihood diversification and food security.

1.2. Statement of the Problems

Ethiopia lies within one of the most food insecure regions in the world, with a large number of its population living at subsistence levels and dependent on farm production which is highly vulnerable to severe droughts, population growth, expansion of the city several times over the past 35 years, Ethiopia's precarious food security has tipped over into full blown famine (Resal Ethiopia, 2001). Food security is highly sensitive to climate risks in Ethiopia. Historical and more recent climate related events such as the 2008/2009 and 2011 food security crises in the Horn of Africa have highlighted the impact of droughts and floods on food production, access to markets and income from agricultural activities (WFP,2015).

The study area, Horo District, is one of surplus producing area in Horo Guduru Wellega Zone of Oromia National Regional state. Farmers earn their livelihood mainly from rain fed small scale agriculture. Even though there is a such no history of chronic food insecurity in the district, farmers face temporarily or seasonal food shortage caused partly by limited attention given to promoting diversified livelihood, including off farm or nonfarm activities.

The other cause of the problems is the persistent expansion of the city of Shambu and Sekelathat has resulted in the sale and conversion of agricultural lands to residential areas. The worse problem to this occurrence is that the lands are being sold at an astronomical rate and almost no land is bought for agricultural purposes. This change in land-use in peri-urban Shambu and Sekela translating to shortage of land for farming has affected food availability within households on the urban fringes of Shambu and Sekela leading to food security being compromised in these localities. It emerged that incomes accrued from lease and sale of lands for housing projects are generally higher than for agricultural purposes, hence the preference of landowners to lease out lands for purposes other than agriculture. In view of this, the food security situation for most households within the described as „poor“ and therefore has to resort to imports from Shambu and Sekela in order to make food available in the area.

Similarly, the present Ethiopia government has also been criticized by some quarters for following rural development policies that neglect the role of peri urban livelihood diversification and their link the rural livelihood activities. (Tassew, 2002), for instance argues that this might be because the role of the income diversification is the least understood component of the rural economy and its role in the broad development process is not well known. This knowledge gap has been reflected in the development policy of Ethiopia where insufficient attention was given to peri urban livelihoods diversification.

1.3. Objective of the Study

The general objective of the study was to examine the livelihood diversification and food security status of households in the study area.

The specific objectives of the study are:-

- i. To assess nature and extent of the farm households livelihood diversification in the study area.

- ii. To determine households food security status in the study area.
- iii. To assess the contribution of off farm and non-farm income to household food security in the study area.

2.0 LITERATURE REVIEW

2.1 Empirical Studies

Engagement in non-farm activities has many advantages that are beneficial in several situations. The most significant way in which non-farm activities differ from other means of livelihood diversification is perhaps that the agricultural risks do not apply. However, natural hazards affecting agriculture often influence the livelihood of many households simultaneously, perhaps even entire communities. Hence, the fact that a general demand might decrease as a consequence of this, even within other sectors, should not be ignored. In fact, agricultural crises tend to affect markets for both agricultural and non-farm products and services (Braun et al. 1998; Ellis 2000). Still, non-farm activities are not directly affected by agricultural risks and even so, most likely to a lesser extent, which makes it an attractive method for risk minimization (Ellis 2000). As "...the agricultural incomes in African rural areas tend to be very unstable due to seasonal and climatic swings, it is... useful to combine agriculture with other activities which are either more stable or swing differently" (Pedersen 1999). Hence, according to Pedersen, non-farm activities are not only an attractive means of livelihood diversification with the incentive of risk minimization, but also as an additional income outside the agricultural season. Within agriculture, seasonality is the main factor determining the production cycles and hence the time of agricultural income opportunity. Ellis explains this fact as follows:

According to Reardon, non-farm activities are primarily a seasonal phenomenon. He points to two reasons for this. First, during the dry season, or the period between production seasons, the farmer is not occupied on his fields and therefore has the physical opportunity to be involved elsewhere. Secondly, the own-produced crops might not be sufficient in order for the household to cope until next harvest. Consequently, the farmer might need to raise additional income, which will ensure the possibility of food purchase in the time to come. These reasons for livelihood diversification towards the inclusion of non-farm activities do thus not only reflect a risk minimization perspective, but also compensation for land constraints. Non-farm activities also appear as an advantageous means of diversification in relation to livelihood diversification with the incentive of compensating for land constraints owing to their independence of agricultural constraints and possibility of engagement outside the agricultural season, providing an additional income, which compensates for insufficient agricultural gain.

While this must be considered context dependent, it expresses an incentive to livelihood diversification based on attempts to increase the standard of living. Concentrating occupational efforts on non-farm activities furthermore appears as steps away from a livelihood based on agriculture. However, such priority might merely reflect a measure of agricultural intensification as "...a proportion of this income may then be used to invest in the productivity of their landholdings" (Hussein & Nelson 1998). Earnings from the non-farm sector might be intended as a means for reinvestment in farm equipment (Reardon 1997:742) and "...may lead to increased investment in local production" (Hussein & Nelson 1998). Contrary to accumulating income for investment with the object of increased standard of living is the view of Sara Berry presented by Hussein and Nelson, emphasizing the improbability of such livelihood strategies. Berry states

that poor producers are unlikely to have such latitude, but rather engage in these activities to “...support consumption and essential current expenses in order to survive”(Berry 1989 in Hussein and Nelson 1998). While not distinguishing whether the incomes initially were intended for consumption or if this in fact was the failed result of the incentive of increasing the standard of living, she maintains the probability of this being the result. Berry hereby argues that non-farm activities most commonly serve as compensation for land constraints, risk minimization, or coping strategies. Not questioning the essence of this argument, Reardon sets forth an allusion of these mechanisms containing further complexity. “Cash earned in the nonfarm sector is sometimes used to hire farm labor, which makes financial sense in that the nonfarm wage is often higher than the farm wage...”(Reardon 1997). This notion of speculation is in line with the one discussed in relation to off-farm activities. It also reproduces the perception that non-farm activities are at times applied as more than risk minimization.

Whether livelihood diversification in the shape of non-farm activities is implemented for the purpose of coping, risk minimization, compensation for land constraints, or increased standard of living, and whether it constitutes a voluntary act or a necessity, all appear to be a question of the people involved, their vulnerability and possibilities, the season and the current situation.

3.0 RESEARCH METHODOLOGY

Multi stage sampling techniques was used to selected sample respondents. Four peri urban Kebele were randomly selected based on 10 km radius of the Shambu and Sekela towns out of the existing 22 Kebeles. Based on proportional sampling size 146 respondents were selected. Data was collected using key informant interview, focus group discussion and interview schedule. Both descriptive and econometric data analysis techniques were applied.

4.0 RESULTS AND DISCUSSION

4.1. Nature and Extent of Livelihood Diversification

In general, livelihoods within the study area focus extensively on informal range of activities, and could be combined in complex ways but their transient nature cannot be overlooked. Hence characterizing livelihood activities at the household level can be complicated, except with reference to the primary activity of the main income earner, and this is how the categorization of livelihoods for various households have been made for this study. Moreover, household livelihood diversification seems very volatile due to the informal nature of the businesses and changes in consumer demands. The volatility of livelihoods especially for those in the secondary activities was confirmed by some respondents.

Table 1: Main occupation of sample households

Occupation of SHHs	N	Percent %
Agriculture	79	54.12
• Staple crops	55	37.77
• Cash crop	3	2.05
• Irrigated high value crops	21	14.3
Livestock	53	36.3
• Livestock trade	23	15.75

• Dairy production	13	8.9
• Fattening	5	3.4
• Small ruminant	10	6.85
• Beekeeping	2	1.4
Petty trade	6	4.10
Off farm/Nonfarm wage employment	8	5.48
Total	146	100

The livelihood nature and extent of refers to their various occupations have been categorized in three different activities. Those with in the primary occupations of the sample households are Agriculture (staple crop, cash crop and irrigated high value crops) whereas the secondary comprised of livestock (livestock trade, dairy production, fattening, small ruminant and beekeeping) and petty trade. In addition the component was made up of wage employers (salaried workers).

Farmers in the study area grow crops under rain fed condition. Farmers plant a mix of crops, of which the major ones *teff*, wheat, Barley and maize. Irrigation is also practiced by some farmers in the area. Few of them earn cash income through the sale of vegetable in the near market. Livestock production is also widely undertaking nonagricultural activities as agricultural income is seasonal. In the study area, the major income sources for the sample households are staple crop sale, cash crop produce, livestock trade dairy production, small ruminant and petty trade and others. Of these, the most important sources of income for all households by it was found to be sale of staple crops 55(37.77%), sale of cash crops 3(2.05%) irrigated high value crops 21(14.28), livestock trades 23(15.75%), dairy production 13(36.3%), small ruminant 10(6.85%), petty trade 6(4.1%) and others 15(9.28%) (Table6) Farming activities, including crop production and livestock production were found to be dominantly with increasing the better off households. The result is also in line with Tesfaye (2003) and Adugna (2008).

4.1.1. Livelihood Constraints

To further explore household livelihoods, critical challenges that households face in livelihood diversification to meet basic needs was assessed by the study. The general constraint facing the livelihood of households was the lack of assets. Since this resource are the fundamental tangible and intangible materials needed to constraint livelihoods diversification.

Critical constraints of livelihood activities in the study area, especially for farmers are the loss of farm lands and grazing lands for residential purposes. This practice has resulted in the loss of previously owned land whereby the compensation for this switch has been contended in courts for long period, this practice affects food availability as farm lands are destroyed at the expanses of housing. This resulted in the loss of grazing land and also the number of livestock production decreased (Table 7)

The predominant occupation of farmers is mixed farming, followed by livestock rearing; this is done in order to address home consumption. Nonetheless, there is population pressure, land degradation and other constraints of production. There is no significant change in the practice of farming in the area. Even though the Woreda is rich in its water resources, the main stay of economy of the people is rain fed agriculture. Moreover, there is no remarkable practice of irrigation based production.

Despite the fact that there is great potential for livestock production (and most households rely on it for their subsistence) the sectors full potential is down played due to absence of organized and improved activities.

Survival is becoming more challenging for many households. The prevailing land scarcity, declining agricultural productivity, rising expenditure needs are the challenges for household's livelihood activities.

Table 2: Livestock production status of Sample HHs

Did you own more animals in the past	No	percent
No	39	26.7
Yes	107	73.3
Total	146	100.0
Reason for livestock decline		
Draught	30	28.1
livestock sale	29	26.7
Others	27	25.3
Disease	21	19.9
Total	107	100.0
list the major problems in livestock production in the area in order of importance		
feed problem	87	59.6
lack of veterinary service	28	19.2
water problem	18	12.3
health problem	13	8.9
Total	146	100

The result indicates that feed shortage, grazing land (59.6%), and lack of veterinary service (19.2%), water problem (12.3%) and health or livestock disease (8.9%). The major livestock production problems ranking in the study area that feed/ grazing land problem, veterinary service and water problems through expansion of the urban priority the areas.

In general, 52.7% of households disclosed that they lack adequate access to credit facilities due to nonexistence of collaterals which are normally required by financial institutions (Table 8). In another case most households take loans that give out loans on a group basis by the formation of group guarantees. But this has become extremely dangerous due to unfaithfulness of some group members as everybody is held responsible when a group member defaults in loan repayment, in this case the farmers also there is no interest received credit at any problem mentioned at that time to attention the above problems.

Table 3: Credit access of households

HH received credit	Frequency	Percent
No	77	52.7
Yes	69	47.3
Total	146	100
If no why		
Other	40	52.1

No need for credit	31	40.4
Lack of asset for collateral	3	3.4
Fear of ability to pay	2	2.7
High interest rate	1	1.4
total	77	100

4.1.2. Income Portfolio of the study

With the existence of multiple constraints to household livelihoods, and in order to make ends meet the study explored the survival strategies that households employ given the limitations on their ability to earn sufficient income from their livelihood diversifications to sustain their households. The predominant livelihood for several households was income diversification through the participation in what they referred as supplementary occupation. This mechanism was mostly utilized by those households whose livelihood diversification dwelled within the secondary activities. It is worth noting that almost all supplementary occupations involved some form of petty trading and livestock selling activities. These households expounded that they chose to do additional since it was a convenient way of ensuring they always had some cash in land, no matter the amount to complement their main source of income generation.

Table 4: The trend of crop production

Trend of crop production	N	Percent
Increased	106	72.6
Decreased	27	18.5
The same	13	8.9
Total	146	100.0

The study area the economy of the household is depending on farming income from agriculture. But the productivities of crops are there is not constant farmers to farmers there are different. (Table 9) 106(72.6%) increase, 27 (18.5%) decreased and 13 (8.9%) the same.

4.2. Food Security Situations

This section examines the food security situation of the households as a livelihood outcome outlined in the livelihood diversification framework. Food security as we have heard over and over, is an issue of income, either income in the form of one's production of food or income earned from activities that might be related to agricultural or not and used to gain access to food through the market. What all we talk about poverty in Africa, is about food security. That is why our poverty measure strongly depends on the reference of fulfilling the minimum daily requirement of food (Gervais *et al.*, 2003). To build a complete picture of how people survive the need is to make sure that we can account for how they meet their minimal survival needs. In line with this argument, in the present study food security is defined as the extent to which a total household expenditure per AE meets its subsistence requirement. For the purpose, total expenditure/AE was used since expenditure is typically preferred over income as it reflects households' ability to meet their basic (Tesfaye, 2003).

Based on results from the basic survey, a distinction is made between food secure and insecure households.

4.2.1. The household food security status

The household food security status is determined by the extent to which the household best qualities on the four criteria of sufficiency, security, access and time. The source of food for the households might be of different types like own production, loan, and gift as friend and purchase and so on. Food security status could be measured in many ways like taking the consumption level or per capital food supplies (Calories/person/days) and the income level which varies depending on the level living standard of the area. The relevant level for food security analysis is that of per capital food supplies. If a person's access to food is below this level, s/he may be classified as food insecure. The relevant analysis for food security by income level is that to take the level from the respective source which fit to the area and consider it in accordance to the level of to the respective sample study area.

In this study, the household food security status was measured by direct survey of total income, food and nonfood expenditure in order to identify the food secure and food insecure households per adult equivalent per annum. The total income and expenditure (Computed in monetary terms) by the household is weighted against the minimum recommended amount of Birr 2998 per person per annum (BOARD, 2010) as a benchmark for graduation of an individual from safety net program. In this research, if the total income and expenditure of the household is less than the recommended amount, the household is categorized under food insecure group otherwise it is categorized under food secured group. Accordingly, 2785 Birr (24.65 %) sample households were found to be food insecure and the remaining ≥ 3001 birr (75.35 %) of sample respondents were food secure. It is found that the total mean total income of sample respondents per adult equivalent was birr 9617 (Table 10). This result was assumed what they produced was enough to feed their family year round and they are not taking food aid from the government.

Table 5: Income of household

Annual Income. birr	Frequency	Percent
150-2785	36	24.65
3001-5000	27	18.49
5001-10000	31	21.24
10001-15000	13	8.91
15001-20000	15	10.27
20001-25000	24	16.44
>2500	5	3.42
Total	146	100

The result of the analysis showed that the annual average household expenditure (education, domestic household basic needs which include salt, sugar, soap, edible oil, clothes and health care total at 3,184.87 birr per year ranges from minimum 85 to maximum 12,300birr.

Table 61: Annual household expenditure

Values	Frequency	Percent
85-1500	29	19.86
1501-2500	42	28.77
2502-3000	19	13

3001-5000	36	24.66
5001-7500	11	7.54
7501-10,000	1	0.68
>10000	8	5.49
Total	146	100

Table7: Food consumed households(quintal)

Consumed / household	Frequency	Percent
0-3	21	14.38
4-5	7	4.8
6-10	32	21.8
11-15	45	31.4
16-25	13	8.8
26-35	17	11.52
>36	11	7.3
Total	146	100

The food security status of SHHs of the study area shows that there is statistically significant different at less than 5 % probability level. The result show that the food security measurement depends on vulnerability indicators future deprivation of food availability. Because it is an expression of a future status. There are genders of the male 96.2% and female 3.8 %who have been reported to be food insecure and members of to be food secured male 92.6% and female 7.4%, total food secured 75.35% and not secured 24.65% X^2 values 0.316 (Table 13). The observable reasons for the result were the contribution of demographic variables such as land size and family size which were reported to be large contribution for the outcome. Such outcome may not be attributed to the weakness of qualitative food security ranking since it doesn't demographic variables that might affect the food security status of households in the process.

Table 72: Food security status of SHHs

			household food security status			χ^2
Variable			Insecure	Secure	Total	
sex of the respondent	Female	N	2	7	9	0.316
		%	3.8%	7.4%	6.2%	
	Male	N	50	87	137	
		%	96.2%	92.6%	93.8%	
Total		N	52	94	146	
		%	100.0%	100.0%	100.0%	
Annual Income		Mean	8761.75	10005.83	9547.021	-0.8494
		SD	8391.633	8391.359	8383.107	
Expenditure		Mean	413.7115	457.1793	441.4826	-0.6136
		SD	319.4142	450.4946	407.3975	

Consumption	Mean	10.09231	17.92135	15.03404	-3.5493
	SD	4.498359	15.50878	13.15017	

4.2.2. Causes of household food shortage

The food situation in Africa is declining to deteriorate as a consequence of multiple calamities such as drought, flooding, decline in soil fertility, increasing pests and diseases, land scarcity, population growth, war, poor market access and discouraging policy environments. The food security situation in Ethiopia According to the Humanitarian Requirements Document (HRD) released at the end of January 2014 by the Government of Ethiopia, 2.7 million people are food insecure, and they will need humanitarian assistance between January and December 2014 due to the combination of environmental, socio political and developmental instabilities (World food program on social networks, 2015).

The sample households were asked to respond to the questions causes of food deficit absence of adequate rainfall 3.4%, insect and pest infestation 46.6%, shortage and poor cultivated land 24.7%, animal diseases 19.9% and flood 5.5%.

Table7: Causes of food deficit

Causes of food/production deficit	N	Percent
absence of adequate rainfall	5	3.4
insect or pest infestation	68	46.6
shortage and poor cultivated land	36	24.7
animal disease	29	19.9
Flood	8	5.5
Total	146	100.0

4.2.3. Months of food shortage

The study result ensured that the months of food shortage majorities' zero or full yearly enough of food consumptions 65.4 %, 26.7% are there are three months of food shortage at the household levels means that the production or food supply there is not enough at yearly and 7.9% food shortages (Table 15). The official months of food shortage include June, August, September and Octobers from the majority of the respondents indicate these months.

Table 8: Status of food shortage SHHs

Number of months food shortage	Frequency	Percent
0-1	97	65.4
3	39	26.7
2	10	7.9
Mean		82.260
S.D		0.288
P.Value		0.000

4.2.4. Food coverage strategy of SHHs during food shortage

Food secured strategies as short term mechanisms that households use for dealing with food shortage. The term used to describe responses were Harvest are 44.5%, purchasing grain from market 35%, support from relatives and friends 4.8 % cash credit to be replaced in kind during harvest 3.4% and grain credit to be replaced in kind during harvest 12.3% (table 16). According to Adugna (2008) this finding will suggest that those households who used cash/grain credit, sale of livestock to food shortage are still highly vulnerable to food insecurity. These measures to be taken involve the need households who accessed relatives support and started wage work need to their capability reverse the situation in the long run.

Table 83: Food coverage strategy of HHs

Cover food shortage	N	Percent%
Harvest	65	44.5
purchasing of grain from market	51	35
grain credit to be replaced in kind during harvest	18	12.3
support from relatives and friends	7	4.8
cash credit to be replaced in kind during harvest	5	3.4
Total	146	100.0

Source: Own survey 2015.

4.3. Contribution of Off Farm/Nonfarm Activities to Food Security

Thought the economy of the household is depending on farming, substantial numbers of farmers are involved in nonfarm activities to supplement farm income. Nonfarm income is the income derived from source other than farming, like petty trade, handicraft, daily labor etc. from data as shown (Table 17) farmers involved in nonfarm employments because they believe that agricultural income is not sufficient enough to stand households food security. About 42.5% of the farmers participated in nonfarm employment tell that insufficiency income from agriculture is the major push factors involvement.

Table 9: Participation of casual labor work

Do you participate casual labor	Frequency (N)	Percent
No	84	57.5
Yes	62	42.5
Total	146	100

Among the respondents that are involved in the nonfarm activities it is indicate that nonfarm employment improve farmers (households) livelihood. Farmers participated in nonfarm employments have shown improvements in daily food self-sufficiency. In addition to this mentioned that decline land size, soil fertility, or productivity is the other major reason. Our study points, among others, the three main reasons that explain the extent and involvement in nonfarm employment are insufficiency of income from agriculture, decline land size the cause of expansion the town, decline soil fertility and productivity.

4.3.1 Description of variables

In this section we present estimation/econometric results of livelihood diversification and food security. As it has been explained in the preceding section, the probability of secured and non-secured given the explanatory and dummy variables is captured by running a Binary Logistic Regression was used to identify food security. The model was selected based on the justification. Therefore, in this section, procedures followed to select independent variables (continuous and dummy) and results of logistic regression analysis conducted to identify livelihood diversification and food security peri urban households in presented.

There for following Guajarti (2004), Multi co linearity problem for continuous explanatory variables was assessed during a technique of variance inflation factor and tolerance level where each continuous explanatory variable on all the other continuous explanatory variables and coefficient of determination is computed

In order to see the degree of association between dummy variables contingency coefficient were computed. According to Healy (1984) contingency coefficient is a chi square (X^2) based measure of association where a value 0.75 above a strong relationship between explanatory variables.

$$C = \frac{\sqrt{X^2}}{N + X^2} \dots \dots \dots (2)$$

C= Coefficient of contingency

X^2 = Chi Square test

N= Total Sample Size

Accordingly, the contingency coefficient, which measures, the association between various discrete variables were computed for six discrete variables in order to check the degree of association among the discrete explanatory variables and there no any problems of association (Appendix Table 1). Similarly, the values of the VIF for four continuous variables were found to be small (i.e VIF value less than 10) indicating the data have no serious problem of multi collinearity. As a result, all the four continuous explanatory variables were retained and entered into the multinomial logistics analysis.

This means that such households have enough food or money to meet households basic food needs at all times, experience of running out of food without money to purchase more food eaten by household members was inadequate in quality or quantity, adjustments to normal food use by substituting fewer foods than usual. The farming households that were food secure engaged entirely in subsistence agriculture where the produce is used for household consumption. It is important to note that almost all the household that were food secure had relatively smaller household sizes of less than 4 and better educational level. This is in accordance with Omonona and Agoi (2007) who mentioned that the incidence of food insecurity decreases with increase in level of education and where households have fewer dependencies to cater for.

Table 10: The values of significant levels food security

Variables	household food security status			t- value
	Insecure	Secured	Total	
	Mean (SD)	Mean (SD)	Mean (SD)	

Age	46.292(9.60211)	44.4247(10.51818)	44.34722(10.8541)	0.9497
Education level	5.9781(3.33755)	6.300 (3.11448)	5.6096(3.53967)	19.149
Family size	6.84615(2.3795)	7.076087(2.2689)	6.99305(2.303832)	-0.574
Land size	1.0703(1.17920)	2.2703 (1.50819)	1.8429(1.51013)	14.746
Market distance	4.3923(2.578)	2.9311(1.930)	3.4662(2.2928)	3.8321
Variable	N (%)	N (%)	N (%)	χ^2
Male headed	50(96.2)	87(92.6)	137(93.8)	0.316
Soil fertility	26(50)	19(18.48)	45(29.86)	15.761
Member coop.	24(46.15)	50(53.85)	74(51.05)	0.7836
Livestock	50(96.15)	92(100)	142(98.61)	3.5883
Wage employ	35(55.07)	29(32.22)	64(40.14)	7.4819

For the 146 sample variable survey we find that the increase in family size, cooperative participation, nonfarm or wage employment, health service and soil fertility were not significantly different from less than one percent. Noticeable and significant reductions were however observed for the practice of age, sex, educational level, land size, use of agricultural technology, distance market, DAs (extension) contacts and livestock trade activities.

4.3.2. Detecting Multicollinearity and Degree of Association

The full information maximum likelihood estimates of the endogenous switching model based on pooled cross sections data are reported (Table 19). The first and second columns present the estimated coefficient of the food secure and insecure group respectively while the logistic regression selection equation value. A whether the estimated coefficients as a group are different between the secure and insecure equation produced a chi squared value of 63.301 with 13 degree of freedom. This means that the coefficients are statistically different.

Table 11: Binary logistic model of household food security status

Variable	Coeff.	Std.Err.	t.ratio	P-value	Marginal effect
Constant	5.777	2.380	5.893	0.015	322.918
Age	-0.051	0.028	3.360	0.067*	0.950
Sex	-2.230	1.050	4.513	0.034*	0.108
Edu. Level. HH	0.155	0.076	4.169	0.041*	1.168
Family size	0.094	0.112	0.711	0.399	1.099
Land size	1.216	0.322	14.284	0.000***	3.375
Soil fertility.	0.039	0.193	0.042	0.838	1.040

Use Inorganic. Ferti.	-1.805	0.882	4.191	0.041*	0.164
DAs contact	-.851	0.321	7.021	0.008**	0.427
Coop. Members	-0.160	0.473	0.115	0.735	0.852
Market Distance	-0.150	0.097	2.568	0.058*	0.855
Livestock trade	1.560	0.416	14.042	0.000***	4.758
Wage Employer	-0.150	0.564	0.071	0.791	0.861
Petty trade	-0.664	0.300	4.891	0.027	0.515
Dependent variable	Food sec				
Log likelihood function	126.844				
Number of Observation	13				
Chi- Square	63.30				
Significant level	0.000				

***, **, *Significant at <1%, 5% and 10% probability level respectively

Source: Own survey, 2015

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

This study has explored household livelihood diversification and food security with in a mixed methods approach. The livelihood diversification framework was employed because it provides an understanding of how household expenditures make thoughtful decisions to make use of limited resources to meet minimum needs in other of preference. In this instance the outcome analyzed was food security. The constraints these households encounter with various livelihoods to meet household needs include lack of assets, loss of farm lands for housing purposes, unfavorable climate conditions. In 24.65% of household interviewed was food insecure. These food insecure households were either petty traders with low educational background or households with low incomes and larger family sizes and low land sizes or land fragments. In another reflections on the dimensions of food security 75.35% household interviewed revealed that, generally, food availability was not a problem within the study area.

5.2 Recommendation

Based on the findings of the study, the following recommendations are hereby made.

- The survival mechanisms include undertaking supplementary occupations, drawing on savings engaging children in trading activities and sale of properties. Signifying their vulnerability.
- Food security situation with in the study area there is not chronic problems as historical but there are bad situations. There is towards their assertion is that they focused only on food availability without touching to access and use. They have implemented policies including food security demonstration to help recover the situation.
- They revealed to have been advising the assembly to create reserve and green for farming during planning since loss of farm lands for expansion of Zonal city state

development is the great challenges they face in addressing the food security situation closely linked to the issues of planning is the concept of economic development. Within the free market as allocation of scarce land is assigned to the highest bidder agricultural land cannot compete with residential land unless there is a deliberate intervention to reserve land for agricultural purpose.

REFERENCES

- Adugna Eneyew.2008. Livelihood strategies and food security in Wolayita, Southern Ethiopia: the case of Boloso Sore district. MSc Thesis, Haramaya University, Haramaya, Ethiopia
- Berhanu Adenew. 2006. Effective Aid for Small Farmers in Sub-Saharan Africa: Southern Civil Society Perspectives; Canadian Food Security Policy Group, Addis Ababa.
- Braun, Joachim von, TesfayeTeklu, and Patrick Webb. 1999: Famine in Africa, Causes, Responses, and prevention. The International Food policy Research Institute.
- Carswell, G.2000. Livelihood diversification in Southern Ethiopia IDS working paper 117.CSA, 2009. C Tesfaye Lemma. 2003. Diversity in livelihoods and farmers strategies in Hararghehighlands, Eastern Ethiopia, University of Pretoria, South Africa.
- Economics Addis Ababa University, Ethiopia
- Ellis, F. 2000. Rural livelihoods and Diversity in Developing Countries, Oxford University pres.
- Ellis, f. and Allison, E. 2004. Livelihood diversification and natural resource access: overseas development group working paper9. University of East Anglia UK.
- entral Statistical Authority population estimates, Ethiopia, Addis Ababa
- Gujarati, D.N. 2004. Basic Econometrics: fourth edition, MacGraw-Hill, New York.
- Hussein, K., and Nelson, J. 1999. Sustainable Livelihoods and Diversification. IDS Working Paper 69. London: Institute of Development Studies.
- Reardon, Thomas. 1997. Using Evidence of Household Income Diversification to Inform Study of the Rural Nonfarm Labor Market in Africa. *World Development* 25, no. 5:735-47.
- Tassew Woldehanna. 2006. Measuring and Monitoring Poverty in Ethiopia: Department of
- Tassew Woldehanna. 2008. Correlates of poverty in Rural and Urban Ethiopia: Department of Economics Addis Ababa University, Ethiopia, Eth. J. of Agric. Econ. 7(1), 49-81