# Rural Household Livelihood Strategies Choices: The Case of Humbo Woreda, Wolaita Zone, Southern Nation Nationalities and Peoples Regional State, Ethiopia

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## Abstract

This study was initiated to identify the rural livelihood strategies choices with special emphasis to Humbo Woreda of Wolaita Zone of SNNPR of Ethiopia. The main objectives of the study were, to identify the existing livelihood strategies choices in the study area and to identify the determinants of rural households` choice of livelihood strategies. Both primary and secondary data sources were used and a total of 140 rural households were contacted. The study results reveal that majority (57.9%) of the sample households participated in agriculture plus non/off-farm livelihood strategies choices to pursue their livelihood. *Out of the total sample households, 42.1% households derive their livelihoods from agriculture 19.3% households combined agriculture and nonfarm livelihood strategy activities, 25 % of households combine agriculture and off farm livelihood strategies* choices *and the rest 13.6 % of households combined agriculture, off farm and nonfarm livelihood strategies* choices. The result of this study shows that drought, crop pests and diseases, livestock diseases are the most common problems raised by the respondents. About 45% respondents reported that drought is the major challenges in their area. About 8 strategies choices were being practiced by the households in the area as a reaction against vulnerability. Among all households, 28.6% of the households participate in different petty trade 18.6% of households participate in different forms of daily labor in the nearby town Humbo. The multinomial logit model analysis shows that out of the total sixteen explanatory variables entered into the model three variables including age, family size (AE) and annual income were influencing rural household choice of livelihood strategies choices of agriculture plus nonfarm activities at different significant level. Out of the sixteen total explanatory variables entered for determining agriculture plus off farm livelihood strategies choices seven variables includes age, sex, family size, total land size, access to training, Cosmopoliteness and participation in social leadership had influenced rural household choice of livelihood strategies choices of agriculture plus nonfarm activities at different significant level. Furthermore from sixteen explanatory variables entered to the model eight variables including age, sex, family size (AE), total land size, distance to market, annual cash income, dependency ratio and remittance had influenced the rural household choice of livelihood strategies choices of agriculture plus nonfarm plus off farm activities at different significant level. Factors which were influence the livelihood choice of household needs attention from concerned bodies for alleviating the situations in the area. Therefore Woreda office of agriculture and concerned bodies in the woreda and around improve the livelihoods of rural households through creating conducive environment for non/off farm activities

**Keywords**: Livelihood Strategy, Choice, Multinomial, Humbo

## 1.  INTRODUCTION

Ethiopia is one of the Sub Saharan Africa country with an estimated population of 90 million is the second populous country in Africa. And its sex composition of the population is almost equal. According to 2007 estimate, population is growing at an estimated annual rate of 2.3. From the total population of the country approximately about 84% are rural population and the remaining is urban population (CSA, 2008). Agriculture is the main source of livelihood especially for the rural poor. The Ethiopian economy largely depends on rain-fed agriculture which accounts for 38 percent of the GDP and 85 percent of total employment (CIA, 2015), with grains, pulses, coffee, oilseed, cotton, sugarcane, potatoes, cut flowers, hides, dairy and meats from cattle, sheep and goats as the main agricultural products. At the same time only 10 percent of total territory has been cultivated, and permanent crops take up just 0.65 percent of the whole territory (CIA, 2011), while 65 percent of country's territory could be used for agricultural purposes.

Today, it is increasingly becoming clear that the agricultural sector alone cannot be relied upon as the core activity for rural households as a means of improving livelihood and attaining food security. One phenomenon that is gaining prominence in the rural development literature is the promotion and support for non-farm diversification opportunities (Stifel and Christiansen, 2007). Non/off-farm economic activities include seasonal migration, wage employment, handicraft production, trading and processing of agricultural produce, provision of agricultural services, etc. Such non-farm activities provide a way of off-setting the diverse forms of risks and uncertainties (relating to climate, finance, markets etc) associated with agriculture and create a way of smoothing income over years and seasons (Barret *et al*., 2001). Drought, erratic rainfall, backward production

technologies, small size of farmlands, and land degradation are the major causes for the low agricultural productivity in Ethiopia. On the other hand, because of shortage of startup capital, limited skills, weak marketing systems and inadequate policy attention, employment opportunities in non-farm or off-farm activities are extremely rare in rural Ethiopia (Gebrehiwot and Fekadu, 2012).*The livelihood strategies here assume that people are already doing a number of creative and productive activities. They have, over generations, developed strategies, appropriate to their context and culture. This study, therefore, attempted to see the rural household livelihood strategy choices* by rural households and analyze the determinants of livelihood strategies choices in the context of achieving food security in the study area besides finding the coping strategies pursued by the households in *Humbo Woreda of Wolaita zone, Southern Ethiopia.*

## 2. METHODOLOGY

### 2.1. Description of Study Area

The study was carried out in Humbo Woreda, Wolaita zone, Southern Nations Nationalities and Peoples Region (SNNPR), South Western Ethiopia which is located 430 kilometres southwest of Addis Ababa, capital city of Ethiopia. The Woreda is one of the 12 Woredas in Wolaita zones of SNNPR (Southern Nations, Nationalities and Peoples' Region). Geographically, it is located at $6^0 43'44$ N latitude and $37^0 45'51''$E longitude with an altitudinal ranges between 1500-2500m a.s.l (Southern Nations Nationalities and Peoples Regional Bureau of Agriculture and Rural Development (SNNPR,BoARD), 2007). Humbo Woreda, as part of the Wolaita Zone, located in the Great Rift Valley, is bordered on the south by Lake Abaya which separates it from the Oromiya Region, on the southwest by the Gamo Gofa Zone, on the west by Offa, on the north by Sodo Zuria, on the northeast by Damot Weyde, and on the east by the Bilate river which separates it from the Sidama Zone. The administrative center of Humbo is Tebela. The agro–ecology of the study *Woreda* consists of 70 percent lowland or *Kola* and 30 percent intermediate highland or *Woina Dega*. The mean annual temperature is $22^0$c. The rainfall is erratic with an annual average ranging from 843 to 1403 mm. The land escape is characterized by hilly terrain traversed by large plains, valleys and gorges. The total area of the *Woreda* is estimated at 86646 km$^2$, out of which cultivated, grazing and unsuitable for agriculture accounts for 38481and12510 km$^2$, respectively while 4980 km$^2$ for other services (Humbo Woreda Agricultural Office, 2012).
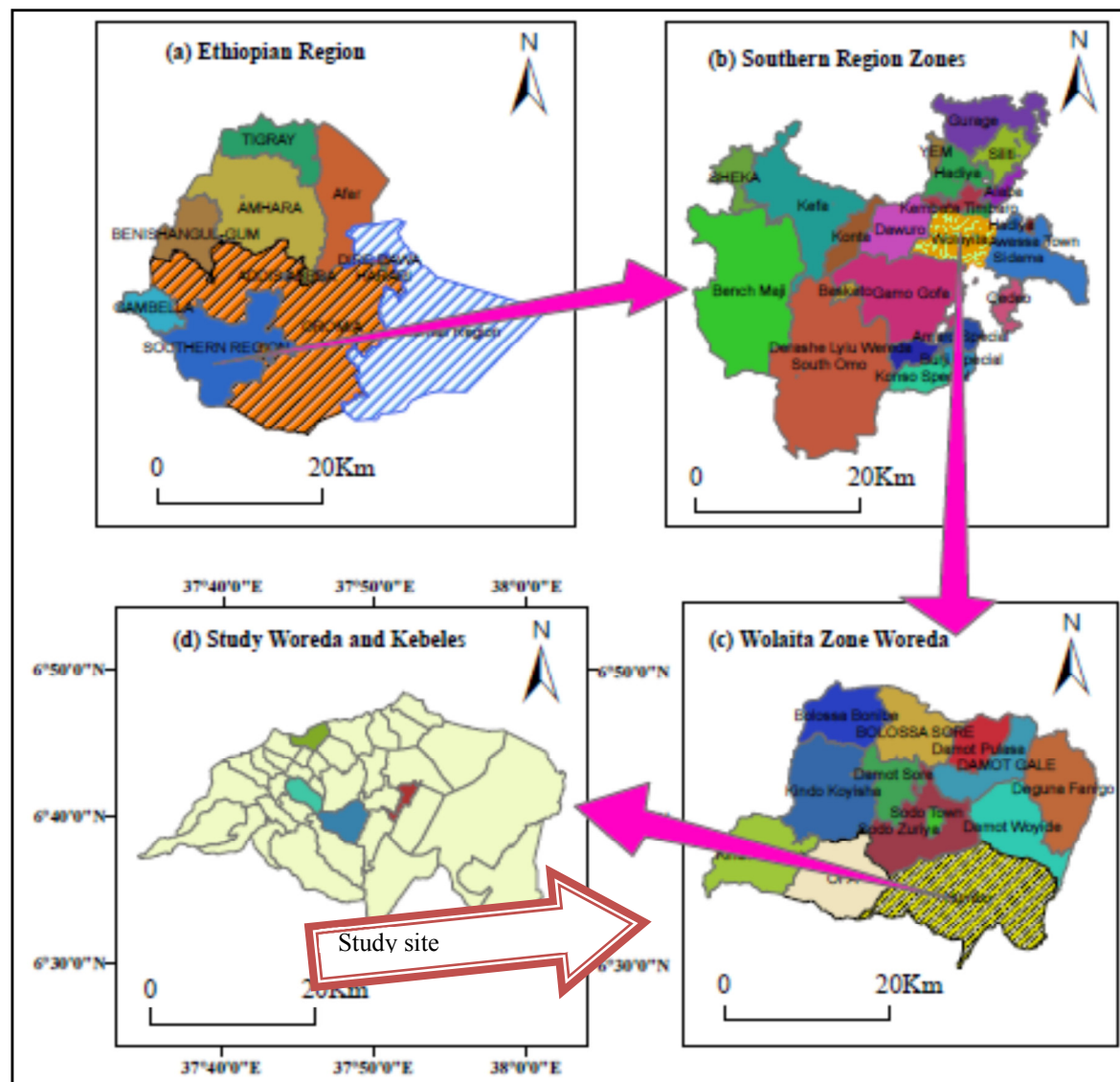
Figure 7 Map of the Study area

### 2.2. Sampling Techniques

This study was conducted in Humbo district of Wolaita zone, Southern National Regional State in Ethiopia. Humbo is one of the 12 districts of Wolaita Zone. It is among the food insecure districts of the Zone where rain-fed agriculture is the mainstay of the local economy. In this study, multi-stage sampling procedure was employed to select sample households. In the first stage, out of the 12 districts in the Zone, Humbo district was selected purposively as it is a drought prone district of the zone, that have different household's livelihood option. In the second stage, the kebeles were listed based on their agro-ecological characteristics and stratified into two ecological zones midland and low land. Based on this, 2 sample kebeles were selected by using simple random sampling techniques from each category of agro-ecological zone. Accordingly Abela Sipa and Abela Qolshobo from *Kola* (low land) and Ombe Shoya and Gutuo Larena from *Weyena Dega* (mid land) were selected randomly. In the third stage, sampling frame (complete village household lists) was obtained from each kebele's administrative office. Therefore, a total of 140 household heads were selected for the survey from four sample kebeles. The number of sample households were determined based on the (Kothari, 2004) formula. This required estimation of tolerable error margin as 0.05 allowing 95% confidence level. Hence, the formula is stated below.

$$n = \frac{z^2 pqN}{e^2(N-1) + z^2 pq}$$

Where: n= the minimum number of sample size within the range of acceptable error margin.
N= the total number of households in the four selected RKAs (2188 hhs)
z= confidence level (95%) and which is 1.96

e= acceptable error margin (0.05)
p= proportion of sampled population (0.11)
q= estimate of the proportion of population to be sampled (0.89)
Based on the above equation, the numbers of sample households selected were 140. Therefore, 140 sample household were selected by using systematic random sampling techniques.

### 2.3 Types and Methods of Data Collection
To utilize and describe the various data sources triangulation were applied. Both primary and secondary data were used which were qualitative and quantitative in nature. Primary data were collected from sample households using structured interview schedules. Secondary data were obtained from different relevant secondary sources. In addition to this, focus group discussion with rural households included male and female households', key informant interview were conducted with non sampled respondents from Woreda agriculture office, kebele administrators and elders from sampled kebeles through personal interview with checklist to supplement the research finding with qualitative information. In conducting the interview, four enumerators who have knowledge about the area and acquainted with the culture and language were recruited and trained before commencing the work. Prior to actual survey, pre-test on non sample respondents was conducted under supervision of the researcher and necessary modifications were made on the basis of the results obtained.

### 2.4 Methods of Data Analysis
Two types of data analysis, namely descriptive and inferential statistics were used to analyze the data collected from sample households. Quantitative categorical types of data were analyzed using percentage, frequency and chi-square test. While quantitative continuous types of variables were analyzed using one way ANOVA, minimum, maximum, mean and standard deviation. Interpretation and tabulation of data were done in order to analyze the qualitative data. After computing the descriptive statistics, multinomial logistic regression was employed to identify determinants of household's choice of livelihood strategies where the dependent variables were found to be multi outcome. The data analysis was conducted using Statistical Package for Social Sciences (SPSS) version 20 and STATA 12.

### 2.4.1 Multinomial Logit Model specification
To identify the determinants behind household's decision to livelihoods strategies the assumption is a rational household head choose among the different income sources that offers the maximum utility which leads to livelihood diversification. Following (Green, 2000), suppose for the ith respondent faced with j choices, we specify the utility choice j as:

Uij = Zij β + εij                                                                                    (1)

If the respondent makes choice j in particular, then we assume that Uij is the maximum among the j utilities. So the statistical model is derived by the probability that choice j is made, which is:

Prob (Uij >Uik) for all other K $\neq$ j                                                    (2)

Where, Uij is the utility to the ith respondent from livelihood strategy j
    Uik   the utility to the ith respondent from livelihood strategy k

Thus, the ith household's decision can, therefore, be modeled as maximizing the expected utility by choosing the jth livelihood strategy among J discrete livelihood strategies, i.e,

Maxj = E(Uij) = fi(xi) + εij ; j=0 …J                                                      (3)

In general, for an outcome variable with J categories, let the jth diversification status that the ith household chooses to maximize its utility could take the value 1 if the ith household choose j[th] diversification status and 0 otherwise. The probability that a household with characteristics x chooses livelihood strategy j, Pij is:

$$ P_{ij} = \frac{\exp(X_i' \beta_j)}{\sum_{j=0}^{J} \exp(X_i' \beta_j)}, \text{ J=0... 4} \qquad (4) $$

With the requirement that $\sum_{j=0}^{J} P_{ij} = 1$ for any $i$

Where: $P_{ij}$ = probability representing the $i^{th}$ respondent's chance of falling into category $j$
    $X$ = Predictors of response probabilities
    $\beta_j$ = Covariate effects specific to j[th] response category with the first category as the reference.

Appropriate normalization that removes an indeterminacy in the model is to assume that $\beta_1 = 0$ (this arise because probabilities sum to 1, so only J parameter vectors are needed to determine the J + 1 probabilities), (Greene, 2003) so that $\exp(X_i \beta_1) = 1$, implying that the generalized equation (4) above is equivalent to

$$\Pr(y_i = j \,/\, X_i) = P_{ij} = \frac{\exp(X_i \beta_j)}{1 + \sum_{j=1}^{J} \exp(X_i' \beta_j)}, \quad \text{for } j = 0, 2 \ldots J \text{ and}$$

$$\Pr(y_i = 1 \,/\, X_i) = P_{i1} = \frac{1}{1 + \sum_{j=1}^{J} \exp(X_i' \beta_j)}, \tag{5}$$

Where: y = A polytomous outcome variable with categories coded from 0… J.

*Note*: The probability of $P_{i1}$ is derived from the constraint that the $J$ probabilities sum to 1. That is, $p_{i1} = 1 - \sum p_{ij}$ . Similar to binary logit model it implies that we can compute J log-odds ratios which are specified as;

$$\ln\left[\frac{p_{ij}}{p_{iJ}}\right] = x'(\beta_j - \beta_J) = x' \beta_j, if, J = 0 \tag{6}$$

### 2.5 Definition of Variables
#### 2.5.1. The dependent variable of the model
If the choice of the household lies in livelihood strategies, rational household head chooses among the four mutually exclusive livelihood strategy alternatives that offer the maximum utility. The polytomous dependent variable for the determinants of rural households' choice of livelihood strategy is defined as follows:

Y=0, if the choice lies in agriculture alone

Y= 1, if the choice lies in Agriculture + nonfarm livelihood strategies

Y=2, if the choice lies in Agriculture+ off farm livelihood strategies

Y=3, if the choice lies in Agriculture + nonfarm+ off farm livelihood strategies

## 3. RESULTS AND DISCUSSION
### 3.1. Descriptive Analysis
For the descriptive statistics, sample households were divided into different livelihood choice groups. Hence, under this section the livelihood assets that affect the choice of livelihood strategies pursued by rural households in terms of their demographic and socio-economic characteristics are presented.

### 3.1.1 Age composition
The number of sample respondents handled during the survey was 140. In the survey, the average age of the households was 41.7years with standard deviation of 6.72. This is below the national average, i.e. 44 years (MOFED, 2002). The age of sample household heads ranged from 27 to 72 years and the majority of them were within the active labour force (98.5%). The average age composition of the sampled households' heads were 45.1, 38.74, 38.74 and 40.89 for agriculture alone, agriculture plus nonfarm, agriculture plus off farm and agriculture plus nonfarm plus off farm livelihood strategies choice groups of households respectively. The mean comparison revealed that there was statistically significant at 1% difference level among the sample households in their choice of livelihood strategy choices. From this finding one can conclude that younger households' were participated more in non/off farm activities than older households'.

### 3.1.2 Sex composition
Among the 140 sample households, the number of male headed households and female headed households were found to be 123 and 17 and covers 87.9% and 12.1%, respectively. From the total sample households, about 96.62%, 85.2%, 82.9% and 73.7% of male headed household were participating in agriculture, agriculture plus nonfarm, agriculture plus off farm and agriculture plus nonfarm plus off farm livelihood strategy choices respectively. From each group of livelihood strategies, male headed households held the lions' share compared to female headed households. The chi-square test shows that there was a statistically significant at 5% difference between male and female headed households in their choice of livelihood strategy choices (Table 1).

Table 1 Distributions of sample households by sex along varying livelihood strategies choices

| Variables | Livelihood strategies choices | | | | | | | | $\chi^2$-value |
|---|---|---|---|---|---|---|---|---|---|
| | **Y =0** | **%** | **Y =1** | **%** | **Y =2** | **%** | **Y =3** | **%** | |
| Sex Male | 57 | 96.62 | 23 | 85.2 | 29 | 82.9 | 14 | 73.7 | 0.032** |
| Female | 2 | 3.38 | 4 | 14.8 | 6 | 17.1 | 5 | 26.3 | |
| **Total** | **59** | | **27** | | **35** | | **19** | | |

** *indicates significant at less than 5% probability level of significance*

*Source: own computation result*

### 3.1.3 Educational level of household head
The educational level of the sample household heads is believed to be an important feature that determines the

readiness of the household head to choose and implement a better livelihood strategy. In terms of educational status 87.9% of them were literate and 12.1% were illiterate. About 40.1% (56) were found at a grade level of one and four, 35.7% (50) were found grade five to six, 12.8% (18) were above grade six. Thus, majority of the respondents were found between grades one to four. The mean education level of households who chose a livelihood strategy of agriculture alone, agriculture plus nonfarm, agriculture plus off farm and agriculture plus nonfarm plus off farm strategy choices was 4.01, 4.07, 2.49 and 3.68, respectively

### 3.1.4 Family size in adult equivalent (AE)

The family size of the sample households ranged from one to eight among the sample households. The average household size of the total sample was 6.38. However, when the crude collected data of household members including sex and age was converted into their respective adult equivalents, the sample household mean was 3.2. Based on their livelihood strategies the mean AE of the household who chose the agriculture alone, agriculture plus nonfarm, agriculture plus off farm and agriculture plus nonfarm plus off farm livelihood strategies were 2.89, 3.22, 3.51 and 3.25, respectively. The F-test has revealed that there is a statistically significant mean difference in the family size among the sample households who have chosen differing livelihood strategies choices at less than 1% probability level of significance. From (table 2) one can conclude that households with more family size participated more in non/off farm livelihood than small family households.

Table 2 Sample households average family size (AE) along varying livelihood strategies choices

| Variable | Livelihood strategies choices | | | | | | | | Total | F- value |
|---|---|---|---|---|---|---|---|---|---|---|
| | Y=0 | | Y =1 | | Y=2 | | Y = 3 | | | |
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD | | |
| Family size (AE) | 2.89 | 0.96 | 3.22 | 1.21 | 3.51 | 1.14 | 3.93 | 0.97 | 3.25 | 5.488*** |
| Total HH | 59 | | 27 | | 35 | | 19 | | | |

*** indicates significant at less than 5% probability level of significance
        Source: own computation result

### 3.1.5 Dependency ratio

This is the dependency ratio of household members whose age is less than 15 years and above 64 years of age to the number of persons in the age group 15 - 64 years (active labor force). It determines the participation of individuals in the labor market, the expenditure patterns and investment in the social sector. The overall mean dependency ratio of sample households was 0.51 with standard deviation of 0.31. The mean dependency ratio of households who chose a livelihood strategy of agriculture alone, agriculture plus nonfarm, agriculture plus off farm and nonfarm strategy were 0.45, 0.55, 0.58and 0.51, respectively. Mean comparison has depicted that there was no statistically significant difference in terms of dependency ratio, among the sample households who have choice for varying livelihood strategies.

### 3.1.6 Ownership of total land

In the agrarian economy, land is the basic livelihood asset for all farm activities and it is important for both crop and livestock production (Siraji, 2007). In the study area almost all household's livelihood income depends on agricultural production, so land is the main factor of production that can determine the livelihood of rural farm households. The overall average private land size of the sample respondents in the study was 1.28 ha. This is similar with the finding of Elias (2006) which was 1.29ha. The mean land holding of households who chose a livelihood strategy of agriculture alone, agriculture plus nonfarm, agriculture plus off farm and strategy were 1.57ha, 0.97ha, 1.12ha and 1.28ha, respectively. The independent F-test result has shown that there is a significant mean land size differences between livelihood strategies at less than 1% level of significance. The farm households who have large mean land size are depends on agricultural activities whereas farm households with smaller mean land size are engaged more in off-farm livelihood strategies.

Table 3 Sample households average land size in (ha) along varying livelihood strategies choices

| Variable | Livelihood strategies choices | | | | | | | | Total | F- value |
|---|---|---|---|---|---|---|---|---|---|---|
| | Y=0 | | Y =1 | | Y=2 | | Y = 3 | | | |
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD | | |
| Total land size | 1.57 | 0.65 | 0.97 | 0.49 | 1.13 | 0.85 | 1.10 | 0.56 | 1.28 | 6.581*** |
| Total HH | 59 | | 27 | | 35 | | 19 | | | |

*** indicates significant at less than 1% probability level of significance
        Source: own computation result

The smaller amount of land size could not support household food and other financial requirements and hence forces them to look for other alternative sources of income. Therefore, the above result suggests that improving the participation of smallholder farm households into profitable off-farm activities in addition to agricultural activities is an effective means to enhance their welfare at house level.

### 3.1.7 Total Livestock owned

Livestock are considered as one indicator of wealth status and used as a source of prestige in the rural areas.

Households owning more number of livestock are considered as wealthy household in the community. It is also one of the most important and crucial assets that farmers heavily depend on to safeguard their household from any sort of internal and external shocks. The total mean livestock ownership of sample households was 3.8 TLU with a standard deviation of 1.08. The mean livestock holding of households who choose the livelihood strategy of agriculture alone, agriculture plus nonfarm, agriculture plus off farm and agriculture plus nonfarm plus off farm were 4.5, 3, 3.4 and 3.3, respectively. The mean livestock holding is significantly different across different livelihood strategies choices at less than 1% probability level (Table 4). This is because a small number of livestock holding do not enable them to generate enough income to support family needs which cause them to participate in non/off-farm activities other than farm activities

Table4 Sample households' average livestock owned along varying livelihood strategies choices

| Variable | Livelihood strategy choices | | | | | | | | Total | F- value |
|---|---|---|---|---|---|---|---|---|---|---|
| | Y=0 | | Y =1 | | Y=2 | | Y = 3 | | | |
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD | | |
| Total livestock owned | 4.5 | 1.77 | 3.0 | 1.03 | 3.4 | 1.19 | 3.3 | 1.49 | 3.8 | 8.247*** |
| Total HH | 59 | | 27 | | 35 | | 19 | | | |

*** indicates significant at less than 1% probability level of significance
Source: own computation result

### 3.1.8 Extension contact
Extension contact delivers services like advice, demonstration, information and distribution of input to rural households. A household who has a frequent contact with extension personnel and service is expected to improve agricultural production and gain better reward from agricultural production. The survey result showed that a household with agriculture alone livelihood strategy choices has a better contact to extension service compared to households pursuing the other three livelihood strategies. The mean frequency of extension contacts appeared to be 1.72, 1.35, 1.37 and 1.26, per week for agriculture alone, agriculture plus nonfarm, agriculture plus off farm and agriculture plus nonfarm plus off farm livelihood strategies choices pursuing households, respectively. Mean comparison has depicted that there is a statistically significant difference at less than 5% probability level of significance in terms of extension contact, among livelihood strategies choices.

### 3.1.9 Credit utilization
Credit is an important institutional service and source of earning future income. Formal financial markets in most developing countries are not competitive and even non-existent in the rural areas. Credit is widely regarded as an important instrument for improving the present and long term economic welfare of households. Those who have access for credit have possibility to invest in farming or other nonfarm activities and this is an important component in small farms development programs and diversification of livelihood strategies. The survey result showed that about 35.6%, 59.2%, 68.6 and 68.4% of household who choose agriculture alone, agriculture plus nonfarm, agriculture plus off farm and agriculture plus nonfarm plus off farm livelihood strategy choices received credit respectively. **The chi square test result revealed that there is** a statistically significant difference at less than 1% probability level of significance in **between the households who had received and not received credit in their choice of livelihood strategy.**

Table 4 Distribution of sample households by credit usage along varying livelihood strategies choices

| Variables | | Livelihood strategy choices | | | | | | | | $\chi^2$-value |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Y =0 | % | Y =1 | % | Y =2 | % | Y =3 | % | |
| Credit usage | Yes | 21 | 35.6 | 16 | 59.2 | 24 | 68.6 | 13 | 68.4 | 12.816*** |
| | No | 38 | 64.4 | 11 | 40.8 | 11 | 31.4 | 6 | 31.6 | |
| Total | | 59 | | 27 | | 35 | | 19 | | |

*** indicates significant at less than 1% probability level of significance
Source: own computation result

### 3.1.10 Access to training
Training in new set of skills which can be applied to farming and/or other activities is an important source of support for rural livelihoods and expands income generation options. The survey result showed that the majority of households i.e. around 47.9% of the total sample households were participating in training programs. The detailed survey results also show that 50.8%, 44%, 45.7% and 47.4% of the households with agriculture alone, agriculture plus nonfarm, agriculture plus off farm and agriculture plus nonfarm plus off livelihood strategy **choice** groups did receive training during the 2014/2015 production year respectively.

### 3.1.11 Distance to market
Proximity to the market centers creates access to additional income by providing non/off farm employment opportunities, ease access to input and transportation. In practice, the way households use markets often depends upon the ease of physical access. This study indicated that the mean distance between the homesteads of sample households and the nearest market place is 9.82 km. The average distance for household with livelihood strategy

of agriculture alone, agriculture plus nonfarm, agriculture plus off farm and agriculture plus nonfarm plus off farm was 10.37, 10.25, 9.4 and 8.31Kms from their nearest market center. Mean comparison has depicted that there is a statistically significant difference at less than 1% probability level of significance in terms of distance to nearest market, among the sample households in the choice of livelihood strategies. From (table 6) one can see that households' living near to market center participated more on non/off farm activities than households that are far from market center.

Table 6 Distribution of sample households by mean distance to market center along varying livelihood strategies choices

| Variable | Livelihood strategy choices | | | | | | | | Total | F- value |
|---|---|---|---|---|---|---|---|---|---|---|
| | Y=0 | | Y =1 | | Y=2 | | Y = 3 | | | |
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD | | |
| Distance to near market | 10.37 | 2.97 | 10.25 | 2.28 | 9.40 | 2.48 | 8.31 | 2.62 | 9.82 | 3.337** |
| **Total HH** | **59** | | **27** | | **35** | | **19** | | | |

*** indicates significant at less than 5% probability level of significance*
*Source: own computation result*

### 3.1.12 Social leadership participation
The person's membership and involvement in social leadership activities (such as, PA administration, *equb, iddir* etc) have a higher exposure for social power and utilization than those who did not involve. The result of the study revealed that 16.4% rural households were participated in social leadership activities and the rest 83.6% were not participated in any social leadership activities. From the total households who participated in social leadership 16.9%, 14.8%, 14.3%, and 21.1 % were participants of agriculture alone, agriculture plus nonfarm, agriculture plus off farm and agriculture plus nonfarm plus off farm livelihood strategy choices respectively. From the analysis of the result the chi-square test result shows that participated in social leadership activities was not significantly different among the existed livelihood strategy choices in study area.

### 3.1.13 Access to mass media
The survey result shows that 40% rural households have had access to at least one of the mass media like listening to radio/television and the rest 60% have no access to mass media. From the total households who have access to mass media 42.4%, 33.3%, 40%, and 42.1 % were in the group of agriculture alone, agriculture plus nonfarm, agriculture plus off farm and agriculture plus nonfarm plus off farm livelihood strategy choices respectively.

### 3.1.14 Cosmo politeness
Cosmo politeness is another information variable which influences the livelihood of rural households. The result of the study revealed that 35% of rural households have had access to exposure of other place out of their residence and the rest 65% of rural households have no access to cosmopoliteness. From the total households who have exposure of other place 32.2%, 22.2%, 51.4%, and 31.6 % were in the group of agriculture alone, agriculture plus nonfarm, agriculture plus off farm and agriculture plus nonfarm and agriculture plus nonfarm and off farm livelihood strategy choices respectively.

### 3.1.15 receiving remittances
Receiving remittance refers to relative economic support in the form of money or food to the household from abroad and within the country, mainly from urban to rural dwellers. The result of the study revealed that 18.6% rural households were receive remittance from their relatives and the rest 81.4% were not receive remittance from abroad or in the country. From the total households who received remittance 15.3%, 22.2%, 14.3%, and 31.6 % were in the group of agriculture alone, agriculture plus nonfarm, agriculture plus off farm and agriculture plus nonfarm plus off farm livelihood strategies respectively. From the analysis of the result the chi-square test result shows that receiving remittance was not significantly different among the existed livelihood strategy choices in study area.

### 3.1.16 Annual income of households from agriculture
Annual average income from sell of crops, livestock and livestock product in year 2014/15 by sample households was 7672.8 ETB. This is similar with a study made by Yishak, *et al*., (2014) in Wolaita zone. The mean annual income from sold crops, livestock and livestock products for groups were 8168.5, 5059.3, 8264.3 and 8757.9 ETB for agriculture alone, agriculture plus nonfarm, agriculture plus off farm and agriculture plus nonfarm plus off farm livelihood strategies pursuing households, respectively. Mean comparison has depicted that there is a statistically significant difference at less than 1% probability level of significance in terms of annual farm income varying livelihood strategies.

Table 5 Sample households mean annual farm income

| Variables | Livelihood Strategies | | | | | | | | F- Value |
|---|---|---|---|---|---|---|---|---|---|
| | Y=0 | | Y=1 | | Y =2 | | Y =3 | | |
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD | |
| Annual farm income | 8168.5 | 3718.5 | 5059.3 | 1466.3 | 8264.3 | 2718.3 | 8757.9 | 3322.2 | 8.096*** |
| Total | 59 | | 27 | | 35 | | 19 | | |

*** *indicates significant at less than 1% probability level of significance*

     *Source: own computation result*

### 3.1.17 Annual income of households from nonfarm and off farm

About 57.9% of the respondents reported that they participated in agriculture plus non/off-farm activity during the survey year because agricultural work is not able to generate adequate income for their livelihoods. Thus, on average, a household earned 3008 ETB from all types of non/off-farm activities in 2014/15. The mean annual income from non/off farm was 2783, 2797, and 3715.8 ETB for agriculture plus nonfarm, agriculture plus off farm and agriculture plus nonfarm plus off farm livelihood strategies pursuing households, respectively. Mean comparison has depicted that there is a statistically significant difference at less than 10% probability level of significance in terms of annual non/off farm, among livelihood strategies.

Table 6 Sample households mean non/off farm income

| Variables | Livelihood Strategies | | | | | | F- Value |
|---|---|---|---|---|---|---|---|
| | Y=1 | | Y =2 | | Y =3 | | |
| | Mean | SD | Mean | SD | Mean | SD | |
| Annual non/off farm income | 2783 | 1583.1 | 2797 | 1246.1 | 3715.8 | 1575.9 | 2.982* |
| Total | 27 | | 35 | | 19 | | |

* *indicates significant at less than 1% probability level of significance*

     *Source: own computation result*

### 3.2. Livelihood Strategies Pursued by Rural Households
### 3.2.1 Livelihood strategies

Livelihood strategies are the combination of activities that people choose to undertake in order to achieve their livelihood goals (Ellis and Allison, 2004). Livelihood activities are actions taken by the household to obtain household income. There are different methods of identifying livelihood strategies; but most commonly, economists group households' livelihood strategies by shares of income earned from different sectors of the rural economy (Brown et al., 2006). The approach adopted here is a simple one, but it effectively delineates households into different categories. To determine these strategies, it has been done by categorizing households who have followed similar strategies among the choices of farm, off-farm and non-farm activities. Therefore, here livelihood strategies grouped based on clustering the sources of income that were identified in the study area. In the study area, rural households obtained their household income from three major categories of livelihood activities which include Agriculture, non-farm, and off-farm activities.

Agricultural activities are focused on both crop production and animal husbandry activities. Different crops are grown in the study *kebeles*. Some of the major crops grown in the study area include maize, Enset, *teff*, barley, banana, coffee, cotton, sorghum, potato and sweet potato. Cattle, sheep and goats, donkey, horse, and poultry are reared for both income and consumption purpose. Livestock by-products which are valuable in the study areas are butter, yoghurt, and cheese

Non-farm activities in this study refer to activities takes place outside the agricultural sector. It includes handicraft activities (weaving, spinning, carpentry, house mudding, poet making, remittance etc), petty trade (grain trade, fruits and vegetables trade), selling of local drinks, trading of small ruminants and remittance transfers within and across nations.

Off-farm activities here refer to agricultural activities which take place outside the person's own farm. The activities include local daily wage labour at village level or the neighbouring areas in return for cash payment or the agricultural work at another person's farm in return for part of the harvest in kind and cash. Natural resource based activities like sand, firewood and charcoal selling are the other source of off-farm income for some households in the study areas.

Broad categorization of livelihood strategy is important to guide policy. Out of the total sample households, 42% households derive their livelihoods from agriculture, 19.3% HHs combined agriculture and nonfarm livelihood strategies, 25 % of households combine agriculture and off farm livelihood strategies and the rest 13.6 % of HHHs diversify their livelihood into agriculture, off farm and nonfarm livelihood strategies in combination as indicated in the table 9.

Table 7 Sample households' livelihood strategies

| Variables | Livelihood strategies | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Y =0 | % | Y =1 | % | Y =2 | % | Y =3 | % |
| livelihood strategies | 59 | 42 | 27 | 19.3 | 35 | 25 | 19 | 13.6 |
| **Total** | **59** | | **27** | | **35** | | **19** | |

*Source: Survey result, 2015*

### 3.3 The Econometric Model Result
### 3.3.1 Discussions of the econometric model results

Before running the multinomial regression logit model it is necessary to conduct a multicollinearity test. Thus, variance inflation factor was used to test the multicollinearity problem among continuous variables and contingency coefficient was computed to see the degree of association among dummy/categorical variables. The larger value of Variance Inflation Factor (VIF), usually values exceeds 10 indicates a serious multicollinearity problem. The value of contingency coefficient ranges between 0 and 1. A value close to 0 indicates weak association and a value close to 1 indicates presence of strong association. Therefore, contingency coefficient value of 0.75 or above indicates a stronger relationship between explanatory variables and shows presence of multicollinearity (Gujjirati, 2003). The multicollinearity test results have shown no serious problems among the continuous and categorical independent variables. Here, the researcher tries to estimate and present findings on the factors that determine choices of different livelihood strategies. Multinomial logit model regression shows the determinant variables for each category versus the base category. Accordingly, the base category is the household who choose agriculture alone as a livelihood strategy. This strategy is used as a reference category. The STATA version 12 was used to generate the parameter estimates. The parameter estimates of the multinomial logit model give only the direction of the effect of explanatory variables on the dependent variable, but the estimates neither stand for the actual size of change nor the probabilities (Chilot, 2007). However, the marginal effect measures the expected change in the probability of a given choice that has been made in relation to the unit change in the explanatory variable. Thus, the predicted probabilities are better interpreted using the marginal effects of the multinomial model (Greene, 2003).

The multinomial logit model analysis shows that out of the total sixteen explanatory variables entered into the model three variables including age (AGE), family size (AE) and annual cash income (INCOM) were influencing rural household choice of livelihood strategies of agriculture plus nonfarm activities at different significant level. Out of the total explanatory variables entered for determining agriculture plus off farm livelihood strategies seven variables includes age(AGE), sex (SEX), family size (FASZ), total land size (TOLDSZE), access to training (ACTRNG), cosmopoliteness(COPOLT) and participation in social leadership(SOLEADER) were influencing rural household choice of livelihood strategies of agriculture plus nonfarm activities at different significant level. Further more from sixteen explanatory variables entered to the model eight variables including age (AGE), sex (SEX), family size (FASZ), total land size (TOLDSZE), distance to market (DISMARK), annual cash income (INCOM), dependency ratio (DEPRATIO) and remittance (REMTNCE) were influencing rural household choice of livelihood strategies of agriculture plus nonfarm plus off farm activities at different significant level. (Table16). However, the magnitude effect of some significant variable is not similar for the three livelihood strategies. Some was highly significant to affect the choice of a strategy and may be insignificant for the other. Therefore, multinomial logit analysis results indicate selection of each type of livelihood strategy is affected by different factors and at different levels of significance by the same factor (Table 10).

Table 8 Multinomial logit model result of Households choice of Livelihood Strategies

Household livelihood strategies

| Variables | Agriculture + nonfarm | | | Agriculture + off farm | | | Agriculture + nonfarm+ off farm | | |
|---|---|---|---|---|---|---|---|---|---|
| | Coef. | P-value | Marginal effect | Coef | P-value | Marginal effect | Coef | P- value | Marginal effect |
| AGE | -.4107285 | 0.000 *** | -.0260453 | -.4161748 | 0.000 *** | -.0629274 | -.2790739 | 0.011 *** | -.0080201 |
| SEX | -2.324015 | 0.105 | -.0674578 | -2.674214 | 0.041 ** | -.3083614 | -2.967707 | 0.034 ** | -.1419277 |
| FMSZE(AE) | 1.418272 | 0.031** | .0731929 | 1.691499 | 0.004 *** | .2451437 | 1.989831 | 0.002 *** | .0976604 |
| EDULEVL | -.1652409 | 0.222 | -.0156286 | .0158971 | 0.917 | .0110751 | -.1453481 | 0.426 | -.0095285 |
| TOLDSZE | -.605843 | 0.426 | .0332442 | -2.214517 | 0.003 *** | -.3475354 | -3.1054 | 0.001 *** | -.1757869 |
| TLU | -.2912204 | 0.526 | 0303501 | -.0038595 | 0.991 | .0044526 | .1631638 | 0.725 | -.1757869 |
| FRCONTCT | -.1636631 | 0.724 | .0080904 | -.5655265 | 0.225 | -.087324 | -.8479884 | 0.154 | -.0488459 |
| ACCRDT | -.12186 | 0.885 | -.0504869 | .9186074 | 0.187 | .1500789 | 1.328299 | 0.104 | .0779847 |
| ACTRNG | -1.094809 | 0.152 | -.0574447 | -1.630851 | 0.022 ** | -.2738247 | .0383734 | 0.970 | .0451119 |
| DISMARK | -.0175034 | 0.907 | .0015391 | -.0156481 | 0.905 | .0041247 | -.3147884 | 0.048** | .0226247 |
| ANINCOM | .0006827 | 0.001*** | .000077 | .0001985 | 0.127 | .0000516 | .0003451 | 0.071 * | .0000273 |
| DEPRATIO | 1.774123 | 0.506 | .2185346 | .0034879 | 0.999 | .0469882 | -4.686108 | 0.077 * | .3600107 |
| COPOLT | .8894097 | 0.284 | .0239851 | 2.355439 | 0.002 *** | .4448611 | -.6009724 | 0.624 | -.1018535 |
| MASMDIA | -.2790064 | 0.731 | .0064431 | -1.068972 | 0.167 | -.1797256 | -.5032942 | 0.554 | -.0127177 |
| SOLEADER | .0763571 | 0.937 | .0331671 | -1.509695 | 0.081* | .2325182 | .6210652 | 0.491 | .0861568 |
| REMITA | 1.155469 | 0.214 | .0731454 | .3950646 | 0.691 | -.0475711 | 2.235751 | 0.066 * | .2352808 |

Number of obs   =      140

Log pseudo likelihood = -97.833963

Wald chi$^2$ (48)   =    155.69

Prob > chi2   =    0.0000

Pseudo R2   =    0.4621

**Age of household head (AGE):** As expected**,** this variable was found negatively influence farmers decision to diversify to nonfarm, off farm and combination of the three activities at 1% significant while performing the livelihood domain agriculture, which implies that households participated in agriculture plus non-farm, agriculture plus off farm and agriculture plus nonfarm plus off farm activities at a decreasing rate as their age increase. From Table 20, it can be seen that the likelihood of a households simultaneous choice of agriculture plus nonfarm, agriculture plus off farm and agriculture plus nonfarm plus off farm activities decreases by 2.6%, 6.2% and0.8 % as age increase by one year. The possible reason is that farmers, whose age is relatively younger, leaving other factors constant, could be pushed to engage more in non-farm activities than agriculture alone. This is because, younger farm households cannot get sufficient land to support their livelihood compared to the older farm households. Older household heads are expected to have better access to land than younger heads, because older farmers usually attain the land from their grandparents whilst younger farmers either have to wait for a land distribution, or work together with their families. Therefore the younger households have to rely more on non/off farm livelihood strategies than the older ones to support their livelihood. This result is similar with previous studies by Barrett *et al*, (2001); Destaw, (2003), Adugna, (2008); Berhanu (2007), and Khan (2007).

**Sex of households**: As hypothesized sex has a negative and significant relationship to agriculture plus off farm and agriculture plus nonfarm plus off farm livelihood strategy choice at 5% and 5% level of significance level respectively. This means female-headed households were tend to participate less in non/off-farm activities. Keeping the influence of other factors constant; the likelihood of female households' choice of agriculture plus off farm and agriculture plus nonfarm plus off farm livelihood strategy decreases by 30% and 14 % respectively. The opposite is true for the male counterparts. This result is in agreement with previous studies conducted by Adugna (2008), Berhanu (2007) and Yishak *et.al* (2014). This implies that female headed households have difficulty of participation in non/off farm activities because of cultural barriers and more responsible for care children, make food for household rather than for market

**Family size (FAMILY):** - Family size refers to the size of household members in Adult Equivalent (AE) which was expected to determine the households' choice of livelihood strategies positively. Family size either determines the availability of family labor or, large family size demands large amount of production to feed its members, i.e., as family size increases, the demand for food increases. As hypothesized family size has a positive and significant relationship to agriculture plus nonfarm, agriculture plus off farm and agriculture plus nonfarm plus off farm livelihood strategy choice at 5%, 1% and 1% level of significance level respectively. This means large family size households were tend to participate more in non/off-farm activities. Keeping the influence of other factors constant; the likelihood of large family households' choice of agriculture plus nonfarm, agriculture

plus off farm and agriculture plus nonfarm plus off farm livelihood strategy choice increased by 7.3%, 24.5% and 9.7 % respectively as number of family increased by one unit. This means the larger the family size the higher the probability to participate in varied non/off farm income sources and the result is in line with study conducted by (Bezmer and Lerman, 2002; Berhanu,2007)

**Total land size**

Total land size (TOLNDSZ): It was found that land size had negatively and significantly influenced the probability of livelihood strategy into agriculture plus off farm and agriculture plus nonfarm plus off farm activities at less than 1% probability level respectively. This implies that farmers with large farm size are less likely to participate in livelihood strategies into off farm than those farmers who have small land size. Large farm size helps farmers to cultivate and produce more, which in turn increases farm income and improves livelihood of a household. On the other hand, declining land sizes under population pressure may encourage rural households to diversify their sources of income. That means, farmers having more land size relay on crop production than to go for non farm and off-farm in order to satisfy basic needs. Keeping the influence of other factors constant; as the size of the land increase by 0.25ha the likelihood of small land size households' choice of agriculture plus off farm and agriculture plus nonfarm plus off farm livelihood strategy decreases by 34.7% and 17.5 % respectively. The result of the study is similar with Lanjouw *et al., (*2001). They pointed out that landholdings per capita are negatively correlated with participation in low productivity non/off farm occupations

**Total annual household income from agriculture**

As anticipated, this variable found to have positive and significant influence on households choice of agriculture plus nonfarm and agriculture plus nonfarm plus off-farm livelihood strategies at less than 1% and 10% probability level respectively. The positive coefficient of marginal effect implies that households with large total household income are more likely to diversify the livelihood strategies into non-farm and/or off-farm activities. The possible reason can be farm households with large total income can invest in alternative livelihood strategies, especially in non-farm activities. The result of the study is similar with study conducted by Yishak *et al*. (2014) found that the total annual cash incomes have positive and significant relationship with agriculture plus non-farm at less than 1% probability level. According to their justification the adequate income sources can overcome financial constraints to engage in alternative non/off-farm activities.

**Dependency Ratio (DEPRATIO):-** As hypothesized, dependency ratio is found to have a significant at 10% positive correlation with choice decision of agriculture plus nonfarm plus off farm livelihood strategy. This indicates that with increase in dependency ratio the ability to meet subsistence needs declines and the dependency problems make it necessary in the household to diversify their income source (Khan, 2007). Households with higher dependency ratios follow less remunerative non-farm livelihood strategies (Jansen *et el.*, 2004). This means when the dependency ratio increase, the ability of farmers to meet family needs decrease and create a chance for alternative livelihood to non/off farm activities increases. As the dependency ratio increases by one unit the probability of the household's falling into agriculture plus nonfarm plus off farm livelihood strategy increases by 36%. This result is consistent with Adugna (2008) the study conducted in Boloso Sore district and inconsistent with that of Warren (2002); and Rao *et al*., (2006).

**Training Conducted (TRAINING):** In contrast with prior expectation, training received is found to have a negatively influence agriculture plus off farm livelihood strategies choices and significant at 5% significance level. Keeping the influence of other factors constant; the likelihood of trained households' participated in agriculture plus off farm livelihood strategy decreases by decrease by 27.3 %. That means the farmer who has access to training would favor to livelihoods strategy into agriculture rather than off activities. This might be due to the training is mainly focused on agriculture. Integrating agricultural training with non-farm enterprise training can help HHs to manage and market their farm production more effectively, to take advantage of new agricultural opportunities. The result is similar with Khatun and Roy (2012). In the study the likelihood of diversifying livelihoods strategy into agriculture plus off-farm and nonfarm activity decreased by 49 % for households who receive training relative to the base category, under ceteris paribus assumption.

**Cosmopoliteness (COSMO):** As expected this variable had positively and significantly related to livelihood strategies. Cosmopoliteness had influenced agriculture plus nonfarm livelihood strategies choices and significant at 1% significance level. Keeping the influence of other factors constant; the likelihood of households' participated in agriculture plus nonfarm livelihood strategy increases by 44.4 % if the household had a chance to visit other place out of his village. That means the farmer who has access to visiting other place would favor to livelihoods strategy into agriculture plus nonfarm activities. This might be due to gaining of new way of livelihood strategies rather than agriculture alone. The exposure he/she received motivated him/her to practice nonfarm activities.

**Receiving remittance (REMITA):** Remittance refers to money sent from inside and outside the country. As expected this variable had positive contribution to the livelihood strategies apart from agriculture plus nonfarm

and agriculture plus off farm at significance of 10 % probability level. This meant that, the likelihood of a household receiving remittance from any source increase the choice of livelihood strategy into agriculture plus nonfarm plus off farm activities increase by 23.5 %. The result is similar with the findings of Adugna (2008).

## 4 CONCLUSIONS AND RECOMMENDATION
### 4.1 Conclusions
The objectives of the study were to identify the existing livelihood strategies in the study area, to identify the determinants of rural households` choice of livelihood strategies and to identify the coping strategies pursuing by household against vulnerability. A multi stage sampling technique was used for selecting the sample households. 140 respondents were selected from four *kebeles*. Households to be selected from each *kebele* were fixed by considering number of households in each *kebele*. This means that PPS sampling technique was employed. Both descriptive and inferential statistics were employed. Household livelihood strategy and the strategy across wealth status were better described in descriptive analysis. Whereas, multinomial logit model was applied to investigate the determinants of likelihood choice of livelihood strategies selected by rural household heads.

The study results reveal that majority (57.9%) of the sample households were participated in agriculture plus non/off-farm livelihood strategies choices to pursue their livelihood. This indicates that in the study area, the agricultural crop production and livestock rearing alone without non/off-farm livelihood strategies is not enough to provide rural households wellbeing. *Out of the total sample households, 42.1% households derive their livelihoods from agriculture alone, 19.3% households combined agriculture and nonfarm livelihood diversification activities, 25 % of households combine agriculture and off farm livelihood strategies and the rest 13.6 % of households diversify their livelihood into agriculture, off farm and nonfarm livelihood strategies in combination.* The results of this study show that drought, crop pests and diseases, livestock diseases are the most common problems raised by the respondents. About 45% households reported that drought is the major challenges for rural households in their area. Crop pests and diseases are the challenges for 23.6% of household. According to the survey result, 16.4% of the households reported that prevalence of animal diseases is the commonest problems in their area. About 8 strategies were being practiced by the households in the area as a reaction against vulnerability. Among all households, 28.6% of the households participated in different petty trade 18.6% of households participate in different forms daily labor in the nearby town Humbo (*Tebela*) town to earn different amount of wages, 12.9% of households transporting commodity of other people using animal driven cart, 11.4% households sold livestock (poultry first, sheep and goats next, and cattle at last) in exchange of money so as to buy food 9.3%, 7.9%, 6.4% and 5% were engaging themselves in sand selling, charcoal selling, getting money from hand craft work and borrowing of money from relatives and close friends

The multinomial logit model analysis shows that out of the total sixteen explanatory variables (seven dummy and 9 continuous variables) entered into the model three variables including age (AGE), family size (AE) and annual cash income (INCOM) were influenced rural household choice of livelihood strategies of agriculture plus nonfarm activities at different significant level. Out of the total explanatory variables entered for determining agriculture plus off farm livelihood strategies seven variables includes age(AGE), sex (SEX), family size (FASZ), total land size (TOLDSZE), access to training (ACTRNG), cosmopoliteness(COPOLT) and participation in social leadership(SOLEADER) were influenced rural household choice of livelihood strategies of agriculture plus nonfarm activities at different significant level. Further more from sixteen explanatory variables entered to the model eight variables including age (AGE), sex (SEX), family size (FASZ), total land size (TOLDSZE), distance to market (DISMARK), annual cash income (INCOM), dependency ratio (DEPRATIO) and remittance (REMTNCE) were influenced rural household choice of livelihood strategies of agriculture plus nonfarm plus off farm activities at different significant level

### 4.2 Recommendations
In the study area majority (57.9%) of the sample households are participated in agriculture plus non/off-farm livelihood strategies to pursue their livelihood income. This indicates that in the study area, crop production and livestock rearing alone without non/off-farm livelihood strategy is not enough to provide rural households sufficient income and sustain household food security. Therefore government and concerned bodies give attention to non/off farm income generating activities for rural communities

The econometric analysis demonstrated that the rural households in the study area are likely to have a diversified livelihood when they have access to exposure of other place. Thus, the concerned bodies should give due attention to the significant variables. Thus, it is recommended that concerned bodies should encourage linkages with other place in the study area.

The significant and negative effect of age on pursuing of none/ off farm activities calls policies instruments to build capacity of young rural farm households in the area of non-farm activities in order to enhance their skill to exploit the alternative opportunity sustainably.

The negative and significant influence of the factor sex on household livelihood strategies choice

considers government and other responsible bodies to design necessary strategies to create awareness among the community to participate women equally with man in all livelihood strategies which secure their benefit and wellbeing.

The positive association with distance to market indicates that the more the market is closer to the rural households, the higher the mobility of people, resource and output. This in turn leads the household to engage in different livelihood activities and earn income. So, giving high emphasis for the development of market center in the nearby area of rural household add extra options like producing cash crops and participate in petty trade for enhancing their wellbeing.

The positive association of total annual income on livelihood strategies of the rural household initiate policy measures to pave the way in order to solve financial problems through developing and strengthening rural financial institution, creating credit access and promoting better income generating options.

The positive and significant influence of households' leadership participation in community based organization points the way to create access to information and creates confidence to participate in various livelihood strategy for people in the same community. This also considers government and other responsible bodies in building capacity through training so as to participate actively in social activities and leadership.

The negative association of total land on livelihood strategies of the household indicates the existing lands is not productive and sustain the livelihood of the rural households. The presence of very small size of land calls for giving emphasis in improving the productivity of land through agricultural intensification so that generate adequate income and food. One of the main reasons for the majority of the households' participation in non/off-farm activity was limited farm income to support their livelihoods. Therefore, measures that could promote investment and employment opportunities in rural non/off-farm activities could help minimize the effects of low agricultural productivity and the resulting of low incomes. Since there is a good potential for agricultural production in the study area, value additions on agricultural products, agribusiness activities along with other non/off-farm activities are some of the important off-farm job opportunities in the study area and therefore, need to be promoted.

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