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Determinants of Rural Household Food Security in Wolaita Zone, South Ethiopia

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Abstract
This study attempted to adders the determinants of rural household food security in Wolaita zone, Southern Ethiopia with the specific objective of Assessing rural households' food security status and identifying the determinant factors of food security of rural households in the study area. In order to achieve these objectives, 180 respondents were selected from, three Woredas were selected purposively because considering the size of people, mostly affected by food shortage and the number of the beneficiary of safety net programme and food aid from the others in the zone and from each Woreda two rural kebeles selected by using systematic random sampling following probability proportional sampling procedure. Both primary and secondary data were used and qualitative and quantitative types of data were employed. The data regarding the determinants of rural household food security were analyzed using descriptive statistics such as mean, standard deviation, percentage and frequency distribution. Inferential statistics such as t-test and chi-square tests were also used to describe characteristics of food secure and insecure groups. Furthermore, Binary logit model were applied. The survey result shows that from the total sample respondents 33.2% and 67.8% was food secure and insecure, respectively. As a result, out of the hypothesized variables which were included in the binary Logit model, 5 variables showed statistically significant relationship with household food security. These are family size of household, educational status of household head, Total annual income of households, Total livestock unit and Oxen ownership of the household. The model estimate correctly predicted 95.6% of the sample cases, 91.4% food secure and 97.5% food insecure. Therefore more attention should be given to limit the increasing population growth through awareness creation and provision of education about use of family planning to both rural men and women on having more household size aggravate the problem of obtaining adequate food for healthy and active life and proper interventions towards improving oxen and livestock ownership through Credit Associations and animal health services are important through extension services.Micro and small scale enterprise should facilitate promoting and expanding income generating activities especially for those who have little or no land for cultivation.
Keywords: Food security, Kilocalorie, binary logistic model, food security

1. Introduction

Food security, which can be explained by the physical and economic access to the food needs of human beings, is often associated with food availability, accessibility and utilization (FAO, 2014). However, poverty, famine and low-income stipulations are the root causes of food insecurity for countries located in drought-prone areas of the world. Food insecurity, hunger and famine had occurred as far back as the beginning of human settlement on the planet earth. Nevertheless, the current problems are so severe and diverse that millions of people in developing countries are suffering from food shortage and die of its predicaments (Arega, 2013).More than one billion people in worldwide are undernourished of which 98% are found in developing countries and the rest (2%) in developed countries (Arega, 2013).

The latest FAO estimate indicate that about 791 million people in developing countries were chronically hungry in 2012-14, down by 203 million since 1990-92(FAO, 2014). The same source also indicated that about 805 million people are estimated to be chronically undernourished in 2012-14, down more than 100 million over the last decade and 209 million lower than in 1990-92. In the same period, the prevalence of undernourishment has fallen from 18.7-11% globally and from 23.4-13.5% for developing countries. Despite this overall progress in developing countries as whole, there is still considerable room to reduce undernourishment and improve food security.

Over the last 10 years, Ethiopia has achieved an overall reduction in poverty levels as well as food insecurity. Nonetheless, poverty and food insecurity remain a big challenge. Over 30% of the population is below the food poverty line, unable to afford the minimum caloric intake for a healthy and active life.Chronic malnutrition is serious, with 44% of children under five years of age stunted and 10% affected by acute malnutrition (WFP, 2014).

The southern Nations, Nationalities and peoples Regional State (SNNPRS) is also one of the food insecure areas in Ethiopia. DPPC, 2012 reported that population number and area of the region facing food insecurity is increasing from time to time. Currently, 1.5 million people in 64 Woreda of the region are vulnerable to chronic and transitory food insecurity and also Many rural households are produce sufficient food for less than six months of the year to meet their food requirements (DPPC, 2012).

Wolaita zone represents one of the major food deficit and famine-prone part of Ethiopia (Almaz et al

2015).The SNNPR livelihood profile 2005 shows that Wolaita Zone is characterized by chronic poverty and food insecurity. Similarly Yeshak, (2014) reported that the rural population in the Zone is frequently and increasingly vulnerable to droughts and famine.

Thus, understanding the determinants of food security in rural households is of primary importance in choosing appropriate interventions for addressing it. This study addressed the determinants of rural household food security with the specific objectives of to Assess the food security status of rural household and identify determinants of rural household's food security of the Wolaita zone, South Ethiopia. Therefore; this study answering the following research questions are;

1. What is the status of household food security in the Wolaita zone?
2. What is the determinant of household food security in the case of Wolaita zone?

Results of this study are expected to provide useful information both for policy makers and researchers in their efforts to improve rural household food security. Thus, the study has practical significance for designing a more targeted and effective food security related development interventions in the study area, and in other similar environments in the country.

2. Methodology

2.1 Description of the study area

The study area (Wolaita Zone) is one of 13 Zones in Southern Nation Nationalities and Peoples Regional State (SNNPRS) of Ethiopia. It is located at 390 km to south west from the capital city of the country. The Zone is located between 6.40- 7.10 N and 37.40- 38.20E, latitude and longitude respectively. It covers a total area of 4,511km2 and is composed of 12 administrative Woredas and 3 registered towns. According to Central Statistical Agency report of 2010, total number of population of the Wolaita zone is about 1,581,650. The Zone is classified into three agro ecological zone; there is Waina Dega (mid-altitude) which is about 56% of the area; Kola (low altitude), 35% and Dega (high altitude) 9%. The estimated average annual rainfall is 801 to 1600mm. The annual average temperature of the zone is 21.86°C. The altitude of the zone ranges from 501 to 3000 meter above sea level (WZFEDD, 2014).

Mixed cropping system is mainly practiced in the area. Cereals, pulses, root crops and fruits are produced in the study area. Mainly Maize and root crops (sweet potato) are the most widely grown crops in the district. Ginger and coffee are important cash crops (WZAO, 2014).

2.2 Sampling technique

The number of sample households was determined based on the Yamane (1967) formula $n = \frac{N}{1 + N(e)^2}$

(Where n is the sample size, N is the population size and e is the level of precision) to determine the required sample size. Furthermore, this study employed; two stages sampling techniques were to select sample households. In the first stage, out of the 12 Woredas in the zone, three Woredas (Humbo, offa and Sodo Zuria) were selected purposively because considering the size of people, mostly affected by food shortage and the number of the beneficiary of safety net programme and food aid from the others in the zone. In the second stage two kebele from each woreda was selected by using random sampling technique to minimize biasness. Finally 180 respondents were selected from the six kebeles using systematic random sampling techniques. The sample respondents chosen from each kebele were selected using probability proportional sampling based on the total number of households in each kebele.

2.3 Method of Data collection

Primary data collection was conducted using survey by means of structured interview schedule for the quantitative part of the data. The interview schedule was pre-tested among the non-sampled respondents of matching characteristics and on the results; it was revised accordingly. The qualitative data was found from focus group discussion. One focus groups in each sampled kebele with eight members who supposed to have clear insight about the overall context of the Woreda. Six enumerators who have adequate knowledge about the area and well familiar with the culture and language were recruited. They were trained on the methods of data collection and contents of the interview schedule.

2.4 Method of Data Analysis

Household caloric acquisition is a measure of the number of calories, or nutrients available for consumption by household members over a defined period of time. Data on available food for consumption include all sources; own farm production, purchase and /or gift/loan/wage in kind were collected for the last seven days before the survey day from the household. The most used recall period for measuring household food security status is one

or two weeks. A one-week/7 day/ period it is easier to remember what has happened since the same day last week (Smith and Ali, 2007).

After the data were collected using seven days recall period, the data were converted to kilocalorie using the food composition table manual (EHNRI, 1997). Then the converted data were divided to household Adult Equivalent (AE) to identify whether the household is food secure or insecure. Then the results were compared with the minimum subsistence requirement per AE per day (that is, 2200 kcal). Households who consume below this minimum requirement were categorized as food insecure and otherwise food secure.

Once the group are categorized as food secured and food in secured, the next step is to identify the determinant factors that are correlated with food security status of the households. Different statistical models were used to identify determinants of household food security. From these, logistic regression was widely used due to: the outcome variable in logistic regression is binary or dichotomous (Hosmer D.W., 1989). There are two primary reasons for choosing the logistic distribution. First, from a mathematical point of view, it is an extremely flexible and easily used function, and second, it lends itself to a clinically meaningful interpretation (Cox and Snell, 1989). The logistic function is used because it represents a close approximation to the cumulative normal distribution and is simpler to work with. Therefore Binary Logit model was employed to identify determinants of food security of the households.

The cumulative logistic probability model specified as (Gujarati, 2004)estimates as follows.Interpretation of the coefficients is understandable if the logistic model can be written in terms of the odds and log of odds (Hosmer D.W., 1989).The odds ratio is the probability that a household would be food secured (Pi) to the probability that it is food insecure (1 - Pi).

$$Pi = \frac{1}{1+e^{-\left[\beta o+\sum(\beta i \mathrm{X} i)\right]}} = \frac{e^{Zi}}{1+e^{Zi}} \quad (1)$$

Where, Pi is the probability that a household would be food secured 0 to1. Zi is the function of a vector of n explanatory variables, βi= are regression parameters to be estimated,e= represents the base of natural logarithms (2.718) and expressed as:

$$Zi = \beta 0 + \sum \beta i \mathrm{X} i + Ui \quad (2)$$

Where, β_i = Vector of theparameter estimates and β_0 = is the intercept. The relationship between Pi and Xi, which is non- linear, can be expressed as;

$$Pi = \frac{1}{1+e^{-\left[\beta o+\sum(\beta i \mathrm{X} i)\right]}} \quad (3)$$

The slope showshow log-odd in favor of food security change asthe respective independent variable change by aunit. The odds ratio is the probability that a household would be food secured (Pi) to the probability that it is food insecure (1 - Pi) and can be written as;.

$$(1-Pi) = 1 - \frac{1}{1+e^{-Zi}} = \frac{e^{-Zi}}{1+e^{-Zi}} = \frac{1}{1+e^{Zi}} \quad (4)$$

Dividing the equation (2) by (4) and simplifying gives:

$$\frac{Pi}{1-Pi} = \frac{1+e^{Zi}}{1+e^{-Zi}} = e^{Z} \quad (5)$$

This equation (5) indicates simply the odd-ratio in favor ofa household would be food secured. The odds ratio is the probability that a household would be food secured (Pi) to the probability that it is food insecure (1 - Pi). Finally, the logit model is obtained bytaking the natural logarithm of the equation (5) as follows;

$$Lij = Ln\left(\frac{P}{1-P}\right) = Zij = \beta 0 + \beta 1X1 + \beta 2X2 + \ldots + \beta nXn \quad (6)$$

If the error term (U) is taken in to account, the Logit model becomes:

$$Lij = Ln(\frac{P}{1-P}) = Zij = \beta 0 + \sum_{i=1}^{j} \beta iXi + Uij \quad (7)$$

Where: i = j = 1, 2… 16.

L_{ij}= is log of the oddsratio which is equal to Z_{ij}, which is not only linearin X_i but also linear in the parameters. It showshow log odd in favor of food security change asthe respective independent variable change by aunit and

X_i= Vector of relevant explanatory variables

β_i= Vector of unknown coefficient

U_i =Error term. The parameters will be estimated usingmaximum livelihood techniques.

The existence of multi-co linearity problems was checked before entering the selected variables in to the logit model in terms of variance inflation factor (VIF) for continuous and contingency coefficients for dummy and discrete variables, respectively. The reason for this is that the existence of multi-co linearity affects seriously the parameter estimates.

2.5 Definitions of variables and Hypothesis

Dependent variable of the study

The dependent variable for this study is household food security. Household food security status is a dichotomous variable representing the status of the household food security in the model taking the value of 1 if the household is food secure and 0 otherwise. It will be hypothesized to be a function of the following variables.

Table 1: Description of the variables and its Hypothesized

Variable code	Description and measurements	Hypothesized sign
HFSS	Is a dummy dependent variable taking the value 1 for food secure households and 0 otherwise	
Agehhh	It is a continuous variable, Age of the household head (years)	+
Sexhhh	Is a dummy variable taking the vale 1 if the house hold head is male, 0 otherwise	-
Family size	Family size of the households in Adult Equivalent(AE)	-
Edustathhh	Is a dummy variable taking the value of 1 if the household is literate, 0 otherwise	+
TAIhh	Is continuous variable the households earning the total annual income (in E.birr)	
LS owned	Total livestock owned by the farm household (TLU).	+
CLSH	Total farm size of household (hectare).	+
DMH	Dependent household members measured in number	+
Use input	Is dummy variable taking the value 1 if the household uses inputs,	+
OX owned	0 otherwise	+
	Ox owned by the farm households measured number	+

3. RESULTS AND DISCUSSION

3.1 Household food security status

The calculated household available energy was compared with the minimum subsistence requirement per adult equivalent per day (i.e.2,200 kcal).The result revealed 67.8% of households were food insecure; whereas, 32.2% of them were food secure. The mean energy available for food insecure and secure households was 1282.45 and 2914.79 Kcal/AE/day, respectively. The minimum and maximum energy intake for food insecure households was 149 and 2194 Kcal, respectively. The minimum and maximum energy intake of food secure households was 2200 and 5175 Kcal, respectively. The t values (18.127) indicate that there is significant mean difference between food insecure and secure households (Table2).

Table 2: Energy available of households per AE per day

Energy available per AE/kcal/	Food insecure (N=122)	Food secure (N=58)	Total (N=180)
Minimum	149	2200	149
Maximum	2194	5175	5176
Mean	1282.45	2914.79	1808.43
Standard deviation	459.921	739.231	949.83
t-value = 18.127	p-value = 0.000***		

***significant at <1 probability level
Source: Owen survey result 2016

3.2 Descriptive statistics of continuous variable

The age of the total sampled households ranged from 20 up to90 years and the overall mean age value is 41.36 years. The mean age value of food secure household heads 39.62 while the food insecure households mean age value of 42.18 years (table 3).

The dependent household members are the age below 15 and above 64 years of age. The mean dependent member of food secure households was 2.19 and that of food insecure households was 2.91. The standard deviation for the food secure and food insecure households were 1.2 and 1.52 respectively. The result of the t-test showed that it its high significance at below 1% probability level (table 3).

The minimum and maximum family sizes of the total sample, food secure and insecure households were 0.75 and 11.75 respectively. The mean size value of the food secure and food insecure households were 3.8 and 4.66 respectively. The result showed that (table 3) the households who have more household members were found food insecure than the others. The t value indicates that it was found as significant at less than 1% probability level.

The cultivated land holding of the total respondent households ranged from 0.03 hectare to 2 hectares. The mean cultivated land size of food secure and food insecure households were 0.53 and 0.29 hectares respectively. The result showed that almost all food insecure households owned less than one hectare of cultivating land. There is statistically significant difference in cultivated land between the two groups, food secure and food insecure, at a probability level of 1% (table 3).

The maximum and minimum, food insecure and secure households earned total cash income of 176 and 17450 (Ethiopian Birr) respectively (table 3). The mean annual income generated by food insecure and secure households was 4136.6 and 1506.1 respectively. The independent t-test showed that there is statistically significant difference between the food secure and insecure households at a probability level of 1%.

Livestock is important source of livelihood in the study area. It contributes as source of transport, nutrition, and income. It also serves as a means of coping mechanism during shortage of food. The total mean size of livestock holding is about 1.9 TLU varying from the minimum zero to the maximum of 7.25 TLU. The mean holding for food insecure and secure households was found to be 3.67 TLU and 1.07 TLU, respectively. The t value indicates that there is statistically significant difference between the two means at a probability level of 1%(table 3).

The minimum and maximum oxen ownership of household was from zero to 5. The mean oxen owner ship of food secure and food insecure was 1.34 and o.1 respectively. The t value shows (table 3), that there is statistical significant difference in oxen ownership between the food secure and insecure households at a probability level of 1%.

Table 3: Descriptive statistics of continuous variable

Variables	Food secure (N=58)		Food insecure (N=122)		Total (N=180)		Min (Max)	T value
	Mean	S.D	Mean	S.D	Mean	S.D		
Agehhh	39.62	12.73	42.18	12.39	41.36	12.529	20 (90)	1.283
DMH	2.19	1.2	2.91	1.52	2.68	1.479	1(10)	3.128***
Family Size	3.8	1.85	4.66	1.73	4.39	1.81	0.75(11.15)	3.053***
CLSH	0.53	0.49	0.29	0.19	0.37	0.34	0.03(2)	4.69***
TAIhh	4136.6	3872.45	1506.1	1569.9	2353.7	2821.5	176 (17450)	6.48***
LS owned	3.67	1.42	1.07	0.84	1.9	1.6	0.0(7.25)	15.32***
Ox owned	1.34	0.81	0.1	0.24	0.5	0.76	0(5)	15.465***

***significant at <1 probability level
Source: Owen survey result 2016

3.3 Descriptive statistics of discreet variable

Table 5 showed from the total sampled households about 29.5% are female headed while 79.5% are male headed

households. From the total female headed households about 73.6% are food secure while from the total male headed households 66.4% are food secure. The Chi-square test indicates that there is no statistical association between food security and sex of household heads. However in the study area during women focus group discussion the Female headed households strongly mentioned that they are faced a great challenge during cropping season which is labor power. It is a critical problem for those; because of this they give their farm land for share crops or rented out.

The educational level of the sampled household heads results reflected that from the total 13.3%are illiterate and 86.7% households are literate. From the total illiterate households more than 95% of household heads were food insecure whereas from the total food secure households about 36.5% are food secure. This indicates that households with relatively low level of education are more likely to be food insecure than those households with better education level. The Chi-square test (table 5) indicates that there is statistical significant between food security and educational level of household heads at less than 1% probability level.

Agricultural inputs are among the most important factors that determine the level of production. Chemical fertilizers and improved seeds, among others, play significant role in increasing productivity and boosting agricultural production. From the total sample households about 56% and44% of households were found to be non-users and users of farm inputs. From those who non use farm inputs about 86.2 % were found to be food insecure and the remained were food secure households. On the other hand, from the all usershouseholds about more than 55% of household heads were found to be food secure. The result shows that the chi-square value, indicate that statistically significant association between input use and level of food security (table 5)

Table5: Descriptive statistics of discreet variable

Variables	Categories	Food insecure (N=122)		Food secure (N=58)		Total		Chi-square
		Frequency	(%)	Frequency	(%)	Frequency	(%)	
Sexhhh	Female	39	73.6	14	26.4	53	29.5	1.16
	Male	83	66.4	44	34.6	127	70.5	
	Total	122	67.8	58	32.2	180	100	
Eductstat	Illiterate	23	95.8	1	4.2	24	13.3	9.981***
	Literate	99	63.5	57	36.5	156	86.7	
	Total	122	67.8	58	32.2	180	100	
Use inputs	No	87	86.2	14	13.8	101	56	35.5***
	Yes	35	44.3	44	55.7	79	44	
	Total	122	67.8	58	32.2	180	100	

***significant at <1 probability level
Source: Owen survey result 2016

3.4 Model Result

The model results showed that the binary logit model correctly predicted 95.6% of the food security status of households. The model chi-square value with 179.132 shows that inclusion of the explanatory variables contributed to improvement in fit of the full model. The Cox and Snell and Nagelkerke pseudo R-square values were 0.63 and 0.881, respectively. The Hosmer Lemeshow test result reported chi-square value of 10.96.

As a result, out of 10 hypothesized variables which were included in the binary logit model, 5 variables showed statistically significant relationship with household food security. These are education status of household head, family size, and Total livestock unit, Oxen Ownership, use of agricultural inputsand total annual income (Table 6).

Family size:

Family size in AE was significant at less than 5% probability level in explaining the household food security. It showed a negative relationship with food security. That means when the size of family members increase the household was less likely to be food secure. Large family size creates more pressure on household food security because more food and non food expenditure is spent for them increases.Therefore, if other factors are constant, an increase of a single adult equivalent reduces the households' likelihood of being food secure by a factor of 0.447. This indicates existence higher demand for food as the family member increases there by affecting the households' food security status.The result agrees with (Tekel L., 2015).

Educational status of household heads

Education is an important factor that helps rural households to get access to every information. As the model result indicates, the variable education had positively and significantly influenced the household food security and statistically significant at 10% which is the same with the hypothesized effect. This is implies that an educated household head is more sensitive to adopt technology to increase the outputgenerated from farm activities. The odd ratio in favor of food secure is increased by 0.009 as the household is educated. This study is in line with the previous studies (Mequanent M., 2014).

Oxen ownership of households

Ox is the main source of traction power among rural households in the study area. The coefficient of number of oxen owned by the household is positive and statistically significant at p<0.01. Household food security and number of oxen owned is positively related. The household who has oxen can generate income by cultivating others land through rent and from his land. This contributes more for household food security. The odd ratio in favor of being food secure is increased by 15.829 when the number of oxen is increased by one. This study is in line with the previous studies (Mequanent M., 2014).

Total Annual income of household

The total annual income was hypothesized to have positive influence on food security. In agreement with the hypothesis, its coefficient came out to be positive and significant at 10% probability level. The probable explanation is that those farmers who have better access to different types of income sources are less likely to become food insecurity. Keeping other variables constant, the odds ratio in favor of food secure increases by a factor of 1.000 for a unit increases in household total annual income. In a study conducted by (Tekile L and Brehanu K.,2015) they found similar result to this finding.

Total Livestock unit of household

The coefficient of number of livestock owned by the household is positive and statistically significant at p<0.01. Household food security and number of livestock owned is positively related.The households also could improve their household food security status by consuming the animal products like milk, cheese, butter, and egg. And also uses as a source of transport and income. It also serves as a means of coping mechanism during shortage of food. This contributes more for household food security. The odd ratio in favor of being food secure is increased by 4.444when the number of livestock is increased by one unit.

Table 6**:** determinants of rural household food security status model result

Variables	Coefficient(B)	S.E	Wald	Sig	Exp.(B)
Sexhhh	0.395	1.024	0.149	0.700	1.484
Agehhh	-0.027	.040	0.448	0.503	0.974
Eductstat	4.658	2.641	3.110	0.078	0.009*
DMH	0.141	0.397	0.126	0.723	1.151
Familysize	-0.805	0.386	4.347	0.037	0.447**
CLS	-0.081	1.920	0.002	0.966	0.922
TAIhh	0.000	0.000	3.520	0.061	1.000*
Use inputs	-0.425	0.894	0.226	0.634	0.654
LS owned	1.492	0.532	7.864	0.005	4.444***
Ox owned	2.762	1.030	7.184	0.007	15.829***
Constant	-1.843	2.174	0.719	0.396	0.158
Sample Size		180			
Log-likelihood ratio test		47.14			
Person chi-square		179.13			
Cox and Snell R2		0.630			
Nagelkerke R2		0.881			
H-L model significant test result		10.695			
Correctly Predicted over all sample (%)		95.6			
Correctly Predicted food secure (%)		91.4			
Correctly Predicted food insecure (%)		97.5			

***, **,*significant at <1, 5, 10 % probability level

Source: Owen survey result 2016

4. Conclusion and Recommendations

4.1 CONCLUSION

The study was conducted descriptive statistics and binary logit model to identify food security status of rural households and the factors which determine household food security status in Wolaita zone. Based on the result the study area is chronically food insecure; and it was found that 67.8% of the total households were food insecure. These households could not cover the required minimum daily calorie which is dominated by subsistence agriculture while only 33.2% of the household were food secure.

The binary logistic regression result revealed that in the study area Family size of the household, education status of household head, Total livestock unit of household , Oxen ownership of the household heads and Total annual income of the households were statistically significant to determine factors of household food security status.

Family size of the households has statistically significant and negatively correlated to food security. An additional increase in household size decreases the likelihood of the household to be food secured. Whereas

education status of household head, Total livestock unit of household , Oxen ownership of the household heads and Total annual income has statistically significant and positive relationships with household food security.

4.2 RECOMMENDATIONS

Based on the findings discussed above, the following recommendations are very crucial to enhance improved food security at household level. The possible areas of intervention include:

- Family size has significant association with the state of household food security. The increasing population pressures need to be retarded through designing and implementing appropriate decisions and measures. This can be acted by the health offices. Therefore more attention should be given to limit the increasing population through awareness creation and provision of education about use of family planning to both rural men and women on having more household size aggravate the problem of obtaining adequate food for healthy and active life.
- Educational status is one of the determinant factors of rural household food security. The minister of education in collaborated with the Woreda education office should give more attention to adult learning programme for those illiterate households.
- Numbers of oxen owned by the households were found to be positively related and statistically significant. Oxen ownership is very important and critical factors for agricultural production in the study area. As a result, the farmers should use their oxen for cultivation of crops to get the required yield from crop cultivation and engaged in income generating activity through renting to the other farmers s. It allows effective utilization of land and labor power. In this regard, proper interventions towards improving oxen ownership through Credit Associations and animal health services are important through extension services.
- The appropriate livestock packages need to be introduced and promoted in the study area since the existence of livestock favors the household food security status. The appropriate livestock type requiring focus are cattle, small ruminants like sheep and goat and poultry besides farming practice. This may be done through identifying the need, potentials and threats to be worked on to improve the household food security status. Therefore, appropriate livestock packages need to be introduced and promoted in the study area
- Total annual income of the household positively affects the food security status of households. Diversifying their source of incomes of households is very important to improve the status of food security. Therefore Micro and small scale enterprise should facilitate Promoting and expanding income generating activities especially for those who have little or no land for cultivation

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