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Rural Household Food Security Status: The Case of Jimma Rare District, Horo Guduru Wollega, Western Ethiopia

Terefe Hundessa Bekana

Department of Geography and Environmental Studies, Addis Ababa University, Addis Ababa, Ethiopia

Email address:
tulumalke@gmail.com

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Abstract: The study looks analysis of food security status in Jimma Rare District, Horo Guduru Wollega, Oromia Regional state, Western Ethiopia. As the basic objective, the study identified major economic and social factors influencing food security in the study area. Systematic sample selection method was used to select 320 sample households. The necessary data were collected using HH survey and key informant discussion and analyzed using descriptive and logistic regression model. Accordingly, the finding of the study shows 45.9% of rural HHs were food secure and 54.1% were food insecure. Natural and socio-economic factor for rural households to be food insecure were identified. Working with collaboration of farmers at the grass root level will realize the confidence of HH food security status. Also proper attention has to be given to mitigate the rapidly growing population, illegal urbanization, increasing farmers' perception on agricultural input to increase productivity.

Keywords: Household, Food Insecurity, Food Security, Logistic Regression

1. Introduction

Today, we live in a world of disturbing contrasts-with hunger in some lands and wastage of food in others-and with the disparity between many of the rich and poor nations widening constantly [30]. This state of affairs is undoubtedly very immoral on any account amidst the world of plenty, and inconsistent with both the [32] that 'every individual has a right to get adequate food' and also the political commitment agreed upon by the heads of the world major states to eradicate hunger and malnutrition on the First World Food Conference in 1974 that 'one should not go to bed hungry [1].

FAO stated that despite the fact that world food production has doubled during the past three decades, the numbers of malnourished people are soaring above 900 million around the world in which 906 million (98%) people live in developing countries. The situation is getting worse in Africa and Asia where more than 800 million undernourished people [12, 6].

Food security situation in Ethiopia is highly linked up to severe, recurring food shortage and famine, which are associated to recurrent drought. More than 50 percent of the total population, of who reside in rural areas, does not have access to the medically recommended minimum average daily intake of 2100 calorie per person per day. The country's average figure is not more than 1,700 kcal [14].

However, [5, 22] and other scholars defines food security as 'access by all at all times to enough food or an active health life', which is contradicting with the current Ethiopian context.

Food security is perceived at the global, national, household and individual [22], which is not guarantee for each other. Food security at international level; and food security at the national level does not guarantee food security at the household level [3, 11]. This shows that, food insecurity exists differently among kebeles, zones, districts and households.

Food security is defined as a condition when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life [13]. It includes at a minimum the ready availability of nutritionally adequate and safe foods; and an assured ability to acquire acceptable foods in socially acceptable ways i.e. without resorting to emergency food supplies, scavenging, stealing or other coping strategies [26].

Food insecurity in the study area is not the outcome of single factor, rather it is the function of both immediate hazard (land slide and degradation, heavy rain with ice) events and

underlying causes (backward saving habits), as well as the specific vulnerabilities of livelihood systems or cultural heritages like social organization (*tazkar, mahiber and arata).*

However, majority of the researches that have been done so far on the issue related to food security in Ethiopia are very general, fail to apply the right measurement tool, give emphasis to aid rather than livelihood protection and promotion, and consider the problem from national level by ignoring the objective reality at individual and household level. Only very few case studies have been done on Woreda, kebele and household level. However, food security or insecurity at national level can fail to be the best case at household or individual level [10]. Food insecurity can even occur under the shadow of favorable natural conditions such as climate (sufficient rainfall, almost absence of drought, and vast fertile agricultural lands), low population pressure, and less resource degradation [15]. Therefore, food insecurity exists everywhere even though its magnitude and dimension is not equal because, it does not ensure that each member of the household is food secure due to discrimination in food distribution within household. This type of vulnerability is most prevalent in the rural parts of Jimma Rare district. Thus, food security is multidimensional in nature and that makes accurate measurement and policy targeting quite challenging.

The current agricultural production system, fertile soil and productivity of arable land shrinkage, decline in livestock population and quality from time to time, declining of agricultural productivity which causes continuing food insecurity are issues that were discussed in this paper. Due to these and corresponding problems like insufficient farm land, family size, educational status off/on farm income, about 14519 population in the study area granted food aid in 2010. Even though due consideration was given, still majority of rural population of the district are food insecure.

2. Materials and Methods

2.1. Study Area

Jimma Rare district is found in Horo Guduru Wollega zone, Oromia Regional state of Ethiopia. The area is bounded by *Challiyaa* district to south, *Guduru* district in north, *Jimmaa Gannatii* District in West and *Midaa Qanyii* district in east. The altitude ranges between 1751m to 3047m above sea level. The total area of the district is 343.53km^2.

The study area is classified in to two climate zone: Dega (high land) which account 53% and Woina dega (Midland) which account 47% with high annual range of temperature 19°C -25°C and rain fall which ranges from 900mm - 1400mm with longer rainy season from May to October occurring in June, July and August. The study area has 154,766 populations having 77619 male and 77147 female Major soil types of the study area include rendzines, haplic, luvicphaeozem (35.5%), luvisols (24.1%), dystricnitsoils (8.7%), pellicvertisoils (31.7%) [9]. The common type of vegetation in Dega climatic zone includes zigba (*podocurpusgracilior/falcatus*), Tikur inchet (*PrunusAfricana*) etc. The woina dega vegetation is Woira (*Prunusafricanum)*, shola (*Ficus Sur)* etc. Commonly known wild animals include arboreal like monkey and apes which are found in both climatic zones. Herbivorous such as pig, Gazelles and Carnivorous like fox, hyena and wild cat are available. About 92% of the total land was used for agricultural activities. Secondary and tertiary economic activities are rarely found in the Woreda except cottage industries [9].

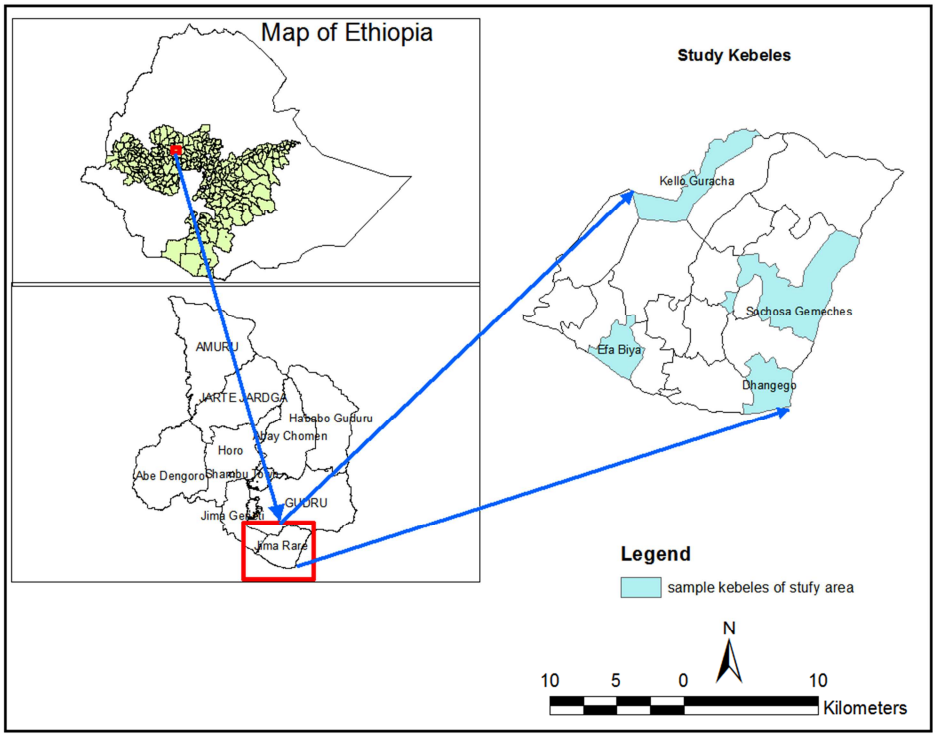

Figure 1. *Location of study Area.*

2.2. Sampling Technique and Source of Data

Mixed (quantitative and qualitative) research technique was employed aiming that integration leads to maximizing the strengths of the quantitative (objectivity) and qualitative (subjectivity) methods and minimizing their weakness [8].

Therefore, the choice of the research design in this study is pragmatism (mixed) research design since food security is one of the most dynamic, complex and multi-dimensional in nature that cannot be handled easily through a single method. In addition, the use of survey questionnaire for quantitative method and an in-depth interview and focus group discussion for qualitative method by the researcher made mixed research techniques, the best research design in this study. Hence, the primary data related to demographic and socioeconomic characteristics were gathered through quantitative survey whereas detail information about household income diversification, accessibility to basic infrastructure and their social networks of the households' were covered through qualitative data collection techniques. This study employed both primary and secondary data.

Four kebeles were selected from the total kebele of the district as a sample size using simple random sampling techniques in the form of lottery method. Finally, Standardized sample selection method was employed in order to select 320 (80x4=320) respondents from the total population of 2547 [27]. The households sample frame was obtained from Kebele Manager and the systematic sample selection of the households was carried out. Sample household was systematically selected from the list as shown in the following formula.

$$k = \frac{N}{n}$$

where, k=the interval to select the target sample, N=Population size and n=sample size to determine interval of selection.

2.3. Method of Data Analysis

Both descriptive and inferential statistics were used to analyze the quantitative data. Statistical Package for Social science (SPSS) version 20 was also used to analyze the quantitative data collected mainly through structured questionnaires. Inferential statistics such as, chi-square test, independent t- test and one -way ANOVA were used to investigate the relationships and differences of the variables as well as to test the mean differences in crop production between the food secure and insecure HH's. Chi-square was used to show the relationship between sex of respondents and their kilocalories consumption where as independent t- test was done to investigate the mean kilocalories intake between food secure and insecure sample respondents.

Accordingly, to sort out which explanatory variables are most closely related to the dependent variable, (continuous and discreet) are identified. Continuous variables (age, family size, number of oxen, farm land size, on/off farm income,) and discrete variables (sex, marital status, educational status and credit access) are considered. This method involves a linear combination of the explanatory or independent variables. Thus, the model used to determine factors affecting current food security status as given below.

$$\pi i = \frac{1}{1+exp\,[-(\beta_0+\sum_{j-1}^{k}\beta_{ji}x_{ji}]} \text{ Where: i=1, 2, 3....320}$$

Where: πi stands for the probability of household i being currently food secure, ji is the observed food security status of household i, jix are factors determining the food security status for household i, and β stands for parameters to be estimated.

In order to measure the degree of relationship between two variables, *Karl Pearson's coefficient of correlation* was employed. This coefficient assumes whether there is linear relationship between the two variables; the two variables are casually related i.e. independent and dependent variables; and a large number of independent causes are operating in both variables so as to produce a normal distribution [19] In this case, it was employed for the test of the degree of relationship between different variables whether they bring effect on food security or insecurity. Thus; Karl Pearson's coefficient of correlation can be worked out:

$$r = \frac{\sum(xi-\bar{x}\imath)(yi-\bar{y})}{\sqrt{\sum(xi-\bar{x}\imath)^2.\sum(yi-\bar{y}\imath)^2}}$$

Where, xi= i th value of X variable,$\bar{x}$= mean of X, $Yi = i^{th}$ value of Y variable,$\bar{y}$= Mean of Y, X = Standard deviation of X *and* Y = Standard deviation of Y.

Households who have year round access to the amount of food required by all household members were regarded as food secure and were assigned a value of 1, otherwise 0. Therefore, logistic regression was used to estimate the effects of explanatory or independent variables (both continuous and categorical) on dependent variables. So, as the determinants of food security were identified using the following formula.

$$Y = \alpha + \beta X$$

Where; Y=dependent variable, x=independent variable, α=constant and β=coefficient of independent variable.

2.4. Hypothesize of the Variables

For the dependent and independent variables, the overall significances of the variables are tested using ANOVA as below;

1. Null Hypothesis (H_0) $X_1 = X_2 = \ldots. X_{11}$ i.e.: There is no linear relationship between the independent variables and dependent variable.

2. Alternative Hypothesis (H_1) $X_1 \neq X_2 \neq \ldots. X_{11}$ i.e.: At least one independent variable influences dependent

The cumulative logistic probability model is econometrically specified as follows

$$[Pi/ (1 – Pi)] = \alpha o + \alpha 1X1 + \alpha 2X2 + \alpha 3X3 + \alpha 4X4 + \alpha 5X5 + \alpha 6X6 + \alpha 7X7 + \beta 1D1 + \beta 2D2 + \beta 3D3 + \beta 4D4 + \beta 5D5 + \varepsilon i$$

Where: i presents the individual i, i = 1, 2, n, Li = is log of the odds ratio which is not only linear in *Xi* but also linear in the parameters; Pi= the probability that an individual is being food secure; (1-Pi)= the probability that a household will not be food insecure; αo: intercept or constant term, that implies the combined impact of these fixed factors on household food security; α1,…, α8: coefficients of continuous explanatory variables (X_1,…, X_7); β_1… β_4: coefficient of explanatory dummy variable and εiis error term.

X_1 = Age of Household: Age refers to a continuous explanatory variable; assumed that the level of food insecurity increases among younger and older household heads than the middle age groups.

X_2 = Sex of Household: Sex is a dummy variable which has the assumption of female headed households are more exposed to food insecurity because of their limited access to livelihood asset than male headed households.

X_3 = Family Size: Family size is a continuous variable in which the smaller family size, the more food secure and vice versa is expected.

X_4 = Educational status of Household Heads: It is a dummy explanatory variable that was hypothesized that food insecurity is increased among household heads by illiterate than the literate one.

X_5 = Farm Land Size: Farm Land size is a continuous variable refers to the total size of land owned by household in hectares. It is assumed that holding small land size increases the probability of being food insecurity.

X_6 = Livestock Holding: Holding livestock is the amount of livestock possessed by households which measured in tropical livestock unit (TLU) that implies increasing in livestock ownership is expected to have positive correlation with food security.

X_7 = Number of Oxen Owned by the HH: It is a continuous explanatory variable measured in numbers. Households with large oxen ownership is expected to be less vulnerable to food insecurity.

X_8 = Off Farm Income: Off farm income generating activities was expected that positively associated with household food security.

X_9 = On farm income: This is an income collected from sale of crop produce, sale of livestock and livestock product and hiring of agricultural land and expected as positive relation with food security.

X_{10}= Use of farm inputs: Refers to use of chemical fertilizer, improved seed, pesticide and herbicide. It is hypothesized that the more HH used farm input, the more he/she produce yield hence food secure.

X_{11} = Credit access: Credit serves as a means to boost production and expand income generating activities. Households who have access to credits from governmental or non-governmental financial institutions have better food availability than who do not have credit access.

2.5. Measurement of Households Food Security Status

To determine whether the HH is food secure or not the 9 HH food security measurement scales/questions were used [7]. To do this, first a HFIAS score variable is calculated for each household by summing the codes for each frequency-of-occurrence question (Q1a + Q2a + Q3a + Q4a + Q5a + Q6a + Q7a + Q8a +Q9a) by coding the frequency occurrence data as 0 for all cases where the answer to the corresponding occurrence question was “no” and 1 when the question was "yes" (i.e., if Q1=0 then Q1a=0, if Q2=0 then Q2a =0, etc.). The higher the score, the more food insecurity the household experienced and vice versa. These questions were part of a population-based survey instrument and applied to all the households in the sample. The amount of calorie available for each 320 sampled rural households was calculated using the following formula:

$$NFA = (GP + GB + GF + RF) - (PH + SR + MS)$$

Where: NFA = net food available, GP = grain produced, GB= grain purchased, GF= grain obtained, RF = relief food received, PH = postharvest losses, SR = seed reserved and MS = marketed output (sold).

Hence, all variables required for the household food balance model were converted from the local grain measurement units into the corresponding kilogram grain equivalent and then changed into kilocalories by using the food conversion table. Finally, FDRE which state 2100 kcal per adult equivalent per day is employed as a cut-off value between food-secure and food-insecure, households whose caloric consumption greater than or equal to 2100Kcal/day/AE was categorized as food secure otherwise food insecure [14, 31].

3. Result and Discussion

Rural Household Food Security

The FDRE which stated 2100 kcal per adult equivalent per day was employed as a cut-off value between food-secure and food-insecure [14]. Accordingly, the finding shows more than 50% of the rural households were food insecure i.e. only 45.9% of rural HHs was food secure and the rest 54.1% were food insecure.

The result reveal that as respondent age increased, the status of the HH to be food secure was also increased. This is quite inconsistent that despite the suitable positive means age that is within labor force bracket, there was still much strains resulting from a reasonable number of elderly and young dependents those need immense livelihood support [20]. It is hypothesized that the older the household, the less productive so as short life expectance. However, in this paper, it is proved that the older the HH, the more they were food secure due to having access of farm land.

In the study area, HHs was dominated by subsistence farming system and the land size was very small which didn’t match with the need of households. Therefore, family size undermines food security status of the households. Earlier researches conducted on determinant of household vulnerability to food insecurity in Malawi on causes of household food insecurity in Oromia region have similar findings stated that large family size creates more pressure on

household food security because more food and non-food expenditure is spent for them increases [18, 16]. Increasing family size tends to exert more pressure on consumption than the labor it contributes to production [29]. The average family size of the sample area is 5.8 with Std. deviation 2.8. This result consistent with Amsalu's finding that the households with large family size, having children of nonproductive age, could face the probability of food insecurity because of high dependency ratio than households with small family size [21].

Households with large oxen ownership is expected to be less vulnerable to food insecurity. Oxen uses as drought power for plouphing and threshing and serves as a means of payment through renting out to farmers that do not owned oxen for land cultivation. Hence, the number of oxen owned was one of the determinants of agricultural production there by to preserve food security. The field survey revealed that the average number of oxen owned by respondents was 2 with the standard deviation of 1.2. The chi-square shows that there was statically significant difference between food secure and insecure due to the difference of oxen possession of HH's at $p < 0.05$ ($t = 50.908$, $df = 1$, $p = 0.000$). As number of oxen owned by the HH increase, the total calorie intake of the HH increases. This finding was consistent with a study made by Haile and which reported, that an increase of ownership of one ox increased the probability of household food security by 40% in Ethiopia. As the result, we can conclude that HH's who have large oxen are less and who have less oxen are more affected by time of food shortage. Thus, number of oxen was positively correlate with food security [16].

Livestock holding has a positive and significant relationship with total calorie intake of households. Interestingly, this has a positive impact on the household food security and increase in the number of tropical livestock unit (TLU) increases household food security. At the times of crop failure, those who have large TLU will survive better than those who don't have less or no TLU. Households who own livestock have good food security status as well as sustainable farming [23, 25].

Although there was disparity in the type and number of livestock holding, field survey revealed that 93% of the households practiced livestock production. The field survey revealed that the total average of livestock in TLU per households was 6.3 TLU with standard deviation of 4.78 TLU. Besides, the average livestock owned by male and female sample households were 6.8 TLU and 3.5TLU respectively. Likewise, the result of chi-square shows that there was statically significant difference between sex and livestock possession at $p < 0.05$ ($t = 43.932$, $df=1$, $p = 0.000$). However, lack of better veterinary service, animal fodder and grazing land are the major determinant factors for the reduction of livestock holding capacity in the study area.

Farm land size is the total area of land cultivated to food and cash crop by households, measured in hectares. Positive relationship has been established between farm size and improvement in households' income and food security [17]. The larger the farm size of the household, the higher the expected level of food production. Therefore households with a larger farm size are more food secure than a household with a smaller farm size due to less agricultural production gain. Hence the effect on food security is positive.

Majority of the food insecure households 120 (69.36%) have less than 3hectors of farm land Providing other associated production factors remain constant, small farmland size increases vulnerability to household food security because the smaller the farmland size, the smaller the volume of crop output [2]. This indicated that having large farmland size was crucial for crop production and thereby to be food secured. Key informants also reported that population pressure and the resultant depletion of soil nutrients were the major reasons why land holding size was declined rapidly from time to time. In addition, land fragmentation is a serious problem in the study area.

Off farm income enables farmers to modernize their production by giving them opportunity to reduce the risks of food shortage during periods of unexpected crop failures. Hence, earning income from off-farm is positively associated with household food security. The regression model shows that off-farm income influence was positive and statistically significant at ($\beta = 0.337$) on household food security status. In another way (VIF=1) which is interpreted as HH participation is less on off farm activity, the less they cope with food shortage. Because VIF is significant at 10% which is interpreted as additional food supply is required. Thus the more the HH participate in off-farm activities particularly during off-season, the more they are food secure but the less HH participate in off-farm activity, the more food insecure opportunity. In relation to food calorie, households participating in off-farm activities have better total calorie availability than those who do not participate. The finding is coincides with the previous findings of different researchers which stated that "households participating in off-farm activities have better total calorie availability than those who do not participate" [25, 28].

On farm income is computed from source of income collected from sale of crop produce, sale of livestock and livestock product and hiring of agricultural land. The more household head engages in gainful employment, the higher he/she earns income and the greater the chances of being food secure [4]. This income was obtained due to the fact that majority of food secure sampled HH's were involved effectively in agricultural activities. In contrary to this, 4.6% of food insecure HH earn annual on-farm income greater than 6705ETB from the land they granted from their parents. However, due to their backward utilization, they were food insecure throughout the year. In another way many of food insecure HH's were not participate more in off/nonfarm activities and hence they were suffering of food shortage.

Participants of focus group discussions informed that due to cultural and other influences, most female-headed households were not effective in out-door (farming) activities as male headed households. There are so many empirical evidences that shows female households are effective in outdoor activities. Besides, kilocalories consumption for

sample household heads was calculated and the average Kilocalories for female headed households was 1069.5 which were lower than the national individual kcl consumption. On the other hand, the male headed HH's kilocalorie consumption was 6023.3. On the top of this, the result of chi-square confirmed that there was statically significant difference between sex and Kilo calories consumption at $p < 0.05$ ($t = 13.9$, $df = 1$, $p = 0.000$). Thus; female headed households were more vulnerable to food insecurity in the study area.

Educated households have a better chance of adopting soil conservation measures and technology use which in turn increases crop production [24]. The result of the analysis show that 59.2% of food secure HH were literate whereas, 40.8% of them were illiterate. Majority (65.3%) of food insecure rural HH in the study cannot read and write or they were illiterate. The Std. deviation of food secure rural HH educational status is 1.2 where as food insecure HH std. deviation is 0.499. Thus, household food security status increases with an increase of educational status of sample households in the study area.

The use of fertilizer has a strong relationship with availability of food. It is common to increase agricultural products using fertilizers, but the question is, does the doze per hectare they use is adequate? Many farmers use farm imputes to enrich fertility of the soil as the soil is exploited for many centuries. But due to inappropriate use of these chemicals an expected yield is not gained.

Households who have access to credits from governmental or non-governmental financial institutions have better food availability than who do not have credit access. In the area, where there is little access to credit limits their ability to purchase seeds, fertilizers and other productive assets which threatens farmers' productivity and put them into a vicious circle. In relation to this, there were two financing institutions established (Oromia Credit and Saving Share Company and Commercial Bank of Ethiopia) as a whole in the study area during the time of survey. However, the role of modern banks as well as other sources of finance for the provision of services to the rural households was quite limited in the study area. Focus Group discussion participants indicated that due to the poor knowledge and the high interest rate, it is too difficult to repay back it, and most households were not eager to use credit services in the study area. Similarly, the interest rate paid by households for the credit they have taken was 17% per month (Oromia Credit and Saving Share Company, 2016). Thus, the field survey indicated that out of the total sampled HH's, only 20.6% of the respondents were credit and saving users from Oromia credit and saving share Company in the study area. The other challenges as the key informants reported was that whether the farmers were succeeded or not for the credit they took, paying the debts was unquestionable either through selling of their livestock or other assets. Hence, it was sorrow for most households to use credit services particularly during times of crop damages.

Table 1. *Summary of multiple linear regression analysis of discrete variables.*

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.886	.183		10.302	.000		
	Respondent sex	-.466	.144	-.137	-3.225	.001	.977	1.024
	Marital status	.306	.025	.586	12.174	.000	.757	1.320
	Educational status	-.360	.054	-.360	-6.666	.000	.603	1.659
	Using fertilizer	-.489	.044	-.490	-11.048	.000	.893	1.120
	Enough access to Credit	-.056	.062	-.045	-.898	.370	.692	1.446

Table 2. *Summary of Multiple Linear Regressions Analysis of Continuous Variables.*

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF*
1	(Constant)	.631	.027		23.483	.000		
	Respondent age	.094	.007	.303	12.756	.000	.148	6.741
	Number of oxen	.253	.012	.247	20.416	.000	.569	1.756
	Off-farm income	.122	.019	.110	6.566	.000	.296	3.382
	Number of children	-.189	.003	-1.070	-72.820	.000	.387	2.586
	On_farm income	.061	.017	.057	3.531	.000	.321	3.114
	TLU	.135	.013	.233	19.321	.000	.642	3.236

a. Dependent Variable: sampled hh, VIF significant at less than 10%

Table 3. *Test of the Model ANOVA.*

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	78.106	11	7.101	16.75	.000
	Residual	1.366	308	.004		
	Total	79.472	319			

Table 4. *Correlation matrix for the continuous explanatory variables.*

	Respondent age	number of oxen	land holding size	Off-farm income	On_farm income	Number of children
Respondent age	1					
Number of oxen	.386**	1				
Land holding size	.737**	.589**	1			
Off-farm income	.792**	.312**	.736**	1		
On farm income	.753**	.300**	.508**	.425**	1	
Number of children	.621**	-.159**	.312**	.503**	.576**	1

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

Table 5. *Correlation matrix for the discrete explanatory variables.*

	Respondent sex	Educational status	marital status	using fertilizer	Enough access to credit
Respondent sex	1				
Educational status	.009	1			
marital status	.127*	.426**	1		
using fertilizer	-.030	.222**	.300**	1	
Enough access to credit	.023	.553**	.254**	.168**	1

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

4. Conclusion

The study identified major economic and social factors influencing food security in Jima Rare district which is one of the food deficit areas of Horo Guduru. The Logit Model results reveal that sex, family size and educational status are negatively influence food security status of the HH. Whereas farm land size, livestock ownership in TLU, number of oxen, off-farm income, on-farm income, use of farm inputs, age and credit access are positively correlate with food security. There is a need of food security strategy which increases food and strengthening emergence response capabilities of the study area.

The ministry of education in collaboration with Oromia educational bureau and district educational office should strengthen non -formal education like (ANFE) education program for those illiterate and less literate HH's so as they learn how to use farm inputs and produce organic farm inputs like compost, how to use selected seeds and recommended fertilizer and individual hygiene. This can be done with the collaboration of health center, agricultural and educational bureau at district and HH level.

Production and improving productivity is possible through integrated watershed management, promoting high value crops and high yielding varieties, protect and restore ecosystems in agricultural landscapes. The water shed development approach is the corner stone of sustainable land management that could improve food security status of HH's in the study area. This also implies that research extension like encouraging FTC have to look for the better so as to improve the HH's food access sustainability.

It was found that livestock possession was an indispensable asset for households' capability to cope with risks and vulnerability to food insecurity. However, lack of feed and high prevalence of livestock diseases were the major constraints. Hence, reallocation for improved animal fodders and crop-residue reservation to feed livestock at a critical time was the best options that every household should take in to account in the study area. It was also strongly recommended that veterinary services should be effectively and timely delivered in all parts of the study area Policies and Strategies that encourage the promotion of off/non-farm activities like, handcrafts, blacksmith, and tanning should have to set up. Especially in the study area, there are a number of people that participate in black smith. So in order to increase income from this activity, government need to organize in the form of small scale micro enterprise by giving capacity building train so as these people can be food secure.

Conflicts of Interest

The author declares no conflict of interest.

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