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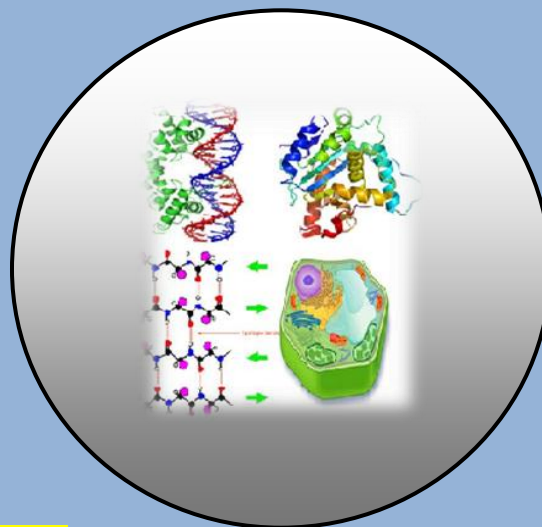
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## **Assesment of Food Security Status of Selected Livelihood Groups in Jimma Town**

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### **ABSTRACT**

*The main objective of the study was to assess the status of household food security of three livelihood groups in Jimma town since livelihood approach is a practical tool for the analysis of household food security. The research was comparative survey among households of three selected livelihood groups namely urban agriculture, small trade and manufacture. Multi stage mixed sampling procedure was used to draw 98 sample from selected livelihood groups. Both primary and secondary data were collected for this study. Primary data were collected through formal survey using semi structured interview schedule, key informant interview and focus group discussion; whereas, secondary data were collected from micro and small scale bureau of Jimma town, central statistical agency bureau and internet. The collected data were analyzed using SPSS version 22.0. Household food security was measured by employing household caloric acquisition based on minimum requirement. Accordingly, 29.6% and 70.4% of the respondents were found to be food insecure and secure, respectively. To address the objective of the study, binary logit and FGT model were used. Among 11 variables included in to the model, household size, access to technology, dependency ratio and income of the household were found to be significant. Food insecure households cope food shortage through reducing quantity and frequency of meal, shifting to cheaper food items, borrowing from relatives, selling existing assets and searching additional daily work. Thus, designing and implementing different interventions with respect to significant variables is very important to alleviate the problem of food insecurity in each sectors in Jimma town.*

**Key words:** Binary Logit , Food Security, Livelihood Group, Nutritious Food and Energy Deficiency.

## INTRODUCTION

Food security exists when all people at all time have both physical and economic access to safe and nutritious food to lead an active and healthy life; Whereas, food insecurity is a global hazard that is threatening every country of the world. It exists when People do not have adequate physical, social or economic access to food. A total number of 925 million people are under nourished. Of whom 239 million are sub-Saharan (FAO, 2010). Accordingly, Ethiopia is a country where 44% of its population live below the national Poverty line and 46% food insecure (Alem, 2007). On the other hand, in terms of food security, Ethiopia is one of the seven African countries that constitute half of the food insecure population in sub-Saharan Africa (Girma, 2012). Many Ethiopians live in conditions of chronic hunger with a low average daily energy supply. It has been plagued with food insecurity for decades (Beyene, 2008). Between 1998 and 2012 ,the average number of Ethiopians in need of food assistance fluctuated between 3 million and 14 million where as other African countries that have comprehensive and sound plans to make their people food secure in the long-term( IRIN, 2012). Similarly, in the ranking of countries on the prevalence of food energy deficiency, Ethiopia is the leading insecurity level by 76.4 %(Smith, 2006). One stark indicator of the precariousness of food security in Ethiopia is the rising dependence on foreign food aid. Food aid has kept people alive, but done nothing to address the causes of food insecurity(EC, 2009). Similarly, Over the course of the last decade, Ethiopia has received an average of 700,000 million ton of food aid annually (Ashebir,2006). Th food insecurity condition in Ethiopia leads to a shift between chronic and acute food insecurity expressed by broad and deep crisis (FDRE, 2003). Moreover, increasing urban poverty is largely attributed to limited broad based and income earning employment opportunities in urban areas (MOFED, 2002). Both chronic and transitory problems of food insecurity are widespread and severe in both rural and urban areas of the country. Ethiopia's food security is shaped by a combination of development challenges and opportunities (USAID,2011). Nevertheless, the global increase of food price has put challenges on and increases food insecurity in urban areas of the country (Alem, 2007; Girma, 2012).Moreover, the various complex and interrelated cause of household food insecurity and local responses during crisis situation less studied in detail at livelihood group level comparatively (UN, 2006).The study was conducted at livelihood group level by considering food insecurity is the most crucial problem facing human beings in Jimma town. The principal purpose of this study was to assess food security status of Jimma Town among selected livelihood groups. Specifically, this research address the following issues. These are : food security status among selected livelihood groups, analysis of determinants of household food security, coping strategies of vulnerable households and extent of food insecurity of the study area.

## MATERIAL AND METHODS

**Description of the study area:** Jimma is the largest city in southwestern Ethiopia. It is a special zone of the Oromia Region and is surrounded by Jimma Zone. It has a latitude and longitude of 7°40'N 36°50'E. The town was the capital of Kaffa Province until the province was dissolved. Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia, this Zone has a total population of 120,960, of whom 60,824 are men and 60,136 women. With an area of 50.52 km<sup>2</sup>, Jimma has a population density of 2,394.30 all are urban inhabitants.

A total of 32,191 households were counted in this Zone, which results in an average of 3.76 persons to a household, and 30,016 housing units. The three largest ethnic groups reported in Jimma were the Oromo (46.71%), the Amhara (17.14%) and the Dawro (10.05%); all other ethnic groups made up 26.1% of the population. Amharic was spoken as a first language by 41.58% and 39.96% spoke Afan Oromo; the remaining 18.46% spoke all other primary languages reported (Census, 2007).

**Sampling procedure:** Multi stage mixed sampling procedure was used to draw 98 sample households from target livelihood groups. Firstly, both Jimma zone and Jimma town were selected purposively to assess its food security status of different livelihood groups. Secondly, three livelihood groups were selected among the five livelihood strategies in the town purposively due to its convenience. In the third stage, probability proportional to sampling technique was employed to draw sample respondents from the selected groups. Finally, 27 from urban agriculture, 43 from small trade and 28 from manufacture livelihood group were selected for this study.

**Data Collection:** Since food security situation changes over time and place, relying merely on secondary data source may lead to wrong conclusions (Alex, 2012). Both primary and secondary data were collected for this study. Primary data were collected from selected livelihood groups by using interview schedule, focus group discussion and key informant interview and secondary data were collected from published and unpublished sources. Semi- structured survey questionnaire was designed and pre-tested to collect the primary data.

**Data Analysis:** Household caloric acquisition was used to measure household food security in the study area. The government of Ethiopia has set the minimum acceptable weighted average food requirement per adult equivalent (AE) per day at 2100 kcal (FDRE, 2001; MOFED, 2002). The information, which identifies the food secure from the food insecure, was obtained by comparing the total food calorie available for consumption in the household per AE to the minimum level of subsistence requirement per AE (2100 kcal) (EHNRI, 1998). Accordingly, the household whose caloric intake less than 2100 Kcal/day/AE was categorized as food insecure other wise secure.

**Statistical Analysis:** The data were analyzed using SPSS statistical software version 22.0. It was used to analyze different variables through descriptive statistics such as frequencies and cross tabulation to generate tabulated reports and charts. Both T-test and Chi square test were also used to test the significance of continuous and categorical variables on household food security, respectively.

The existence of multicollinearity problem between Categorical and continuous explanatory variables were detected by contingency coefficient (C) and variance inflation factor (VIF), respectively.

$$VIF_i = \left( \frac{1}{1 - R^2} \right)$$

Where;  $R^2$  = Coefficient of determination and  $VIF_i$  = Variance Inflation Factor

$$C = \sqrt{\frac{x^2}{x^2 + n}}$$

Where C= Contingency coefficient, n= sample size and  $X^2$  = Chi-square Value

To analyze the incidence, depth and severity of the food insecurity, FGT model was also incorporated. FGT index provides three most commonly employed indices: head count ratio, food insecurity gap and squared food insecurity gap. The head count ratio indicates the number of households whose consumption expenditure is less than 2100 kcal/day/AE. Whereas, food insecurity gap measures how far the food insecure households are below the cut of value; on the other hand, squared food insecurity gap is more closely related to severity of food insecurity but giving those further away from the minimum level a higher weight in aggregation than those closer to the subsistence level (Hoddinott, 2001). The model is expressed as follows

$$FGT(\mathbf{a}) = \frac{1}{N} \sum_{i=1}^q \left[ \frac{Z - y_i}{Z} \right]^a$$

Where, q=number of food insecure households, Z=minimum caloric intake,  $y_i$ = caloric intake of food insecure households,  $\alpha$  =weight attached to food insecurity, and N=total sample size. According to this model, a given household is food secure when  $y_i \geq Z$ .

**Econometric Model:** binary logistic regression model was employed to reveal the effect of different variables on household food security. Household food security is dependent variable for this model. Mathematical expression of the model,

$$L_i = \ln\left(\frac{P}{1-P}\right) = \beta_0 + \beta_1 X_i + U_i$$

Where, P= Probability of being food insecure, 1- p =probability of being food secure,  $\beta_i$ = coefficients of explanatory variables,  $X_i$  = Explanatory variables, and  $U_i$ = Error term

## RESULT

### Food security status of livelihood groups

Livelihood approach is a practical tool for the analysis of household food insecurity with a multidimensional and people centered analysis (Adugna and Wagayehu, 2012). There are five livelihood groups in Jimma town namely urban agriculture, small traders, manufactures, construction and service. Urban agriculture, small traders and manufactures were target source of the sample which represents 27.6 % ( 27), 43.6 % ( 43) and 28.6 % ( 28), respectively.

**Table1. Calorie intake of selected livelihood groups.**

	Urban agri.(N=27)		S. traders (N=43)		Manufacture(=28)		Total (N=98)		
	Insecure	Secure	Insecure	Secure	Insecure	Secure	insecure	Secure	
Min	1687	2102	1673	2113.0	1631	2110.0	1631	2102	
Max	2014.8	8769	1989.	8009.1	2089.8	7909.1	2014.8	8769	
Mean	1799.8	4089.8	1768.1	3989.8	1765.1	3012.8	1772.3	3087	
SD	154.5	1014.8	287.2	1362.7	313.5	1167.3	473.1	1745	
t-value								-5.58***	

\* \*\* significant at p<1% , source: own survey,2014

After food items consumed by selected livelihood groups, it was converted into kcal/day/AE. Accordingly, 12(12.2%), 6(6.1%) and 11(11.2%) of urban agriculture, small trade and manufacturing livelihood groups were found to be food insecure, respectively; 15(15.5%), 37(37.8%) and 17(17.3%) of urban agriculture, small trade and manufacturing livelihood groups were food secure. The table listed below indicates the comparison of caloric intake of those livelihood groups. Finally, the result of mean comparison indicates that there was significant mean difference with respect to caloric intake of those livelihood groups.

**Table 2. Distribution of households by their livelihood assets available in each livelihood groups.**

Variable	Livelihood groups					
	U.Agriculture(N=27)		S. trade(N=43)		Manufacturing(N=28)	
	No.	%	No.	%	No.	%
Educational status						
Literate	23	23.5	40	40.8	27	27.6
Illiterate	4	4.1	3	3.1	8	8.2
Land ownership						
Yes	12	12.2	4	4	3	3
No	15.0	15.3	39.0	39.8	25.0	25.5
Training access						
Yes	19.0	19.4	34.0	34.7	18.0	18.4
No	8	8.2	9	9.2	10	10.2
Access to technology						
Yes	22.0	22.4	2.0	2.0	18.0	18.4
No	5	5.1	41	41.8	10	10.2
Credit access						
Yes	13	13.3	24	24.5	11	11.2
No	14	14.3	19	19.4	17	17.3

Source: own survey, 2014

### Food Security Status of respondents

Food security at the household level is measured by different methods. However, household caloric acquisition was employed to identify the food secure and insecure households though it is a crude estimate (Ejigayhu, 2011). The food items consumed by sample respondents were collected and converted to Kcal/day/AE. Accordingly, 29 (29.6%) and 69(70.4%) of sample respondents were found to be food insecure and secure, respectively. The result was compared with previous studies conducted in the same area. The result of Meskerem and Awolu (2013) indicated that the percentage of food insecure and secure households were found to be 40 % and 60 %, respectively

The descriptive statistics for continuous and categorical variables were presented in tabular form. The presentation is crucial to understand the presence of significant difference between food secure and insecure households. The result indicated that there is significant mean difference between food insecure and secure households in relation to household size and income of households (table 3).

On the other hand, the result of cross tabulation analysis with respect to categorical variables indicated that there is significant association between food insecure and secure households with respect to access to technology (table 4).

**Table 3. Descriptive statistics of continuous variables**

Variable	Food security status								
	Inesecure (N=29)				Secure(N=69)				t-value
	Min	Max	Mean	SD	Min	Max	Mean	SD	
Age of HHH	26	70	43	9	24	63	35	8	3.74
Household size	3	8	5	1	1	8	4	2	5.40**
Food expenditure	3222	24900	10783	4453	1988	37427	10681	5563	0.09
Income of HHs	8000	36000	14324	6318	7500	50000	22653	9652	4.27**
Dependency ratio	0.00	3.00	0.82	0.71	0.00	2.00	0.61	0.56	1.51

\*\* significant at 5% , Source: own survey, (2014)

**Table 4. Discriptive Statistics of Categorical Variables.**

Food security status					
Variable	Food insecure		Food secure		Chi-square
	N	%	N	%	
Educational status					
Literate	24	24.5	66	67.5	4.53
Illiterate	5	5.1	3	3.1	
Sex of HH					
Male	14	14.3	31	31.6	0.09
Female	15	15.3	38	38.8	
Marital status					
Married	21	21.4	47	48	1.36
Unmairred	8	8.2	22	22.5	
Credit Access					
User	13	13.3	35	35.7	0.28
Non-user	16	16.3	34	34.7	
Food security status					
Variable	Food insecure		Food secure		Chi-square value
Training access	N	%	N	%	
Yes	20	20.4	51	52	0.25
No	9	9.2	18	18.4	
Access to technology					
Yes	17	17.3	25	25.5	4.18**
No	12	12.2	44	44.9	
Land access					
Yes	4	4.1	15	15.3	0.83
No	25	25.5	54	55.1	

\*\* significant at 5% , Source: own survey, (2014)

**Extent of food insecurity:** Table 5 presents the extent of household food insecurity analysed using Foster Greer Thorbeke model. FGT model provides three most commonly used indices: head count ratio, food insecurity gap and severity of food insecurity. According to the result of the model, 29.6% of the respondents live below the recommended caloric intake per day per AE; and on average 3.99% of the respondents were far from 2100kcal/day/AE. On the other hand, severity of food insecurity was calculated by assigning a higher weight, the result of the model indicated that the severity of food insecurity is 0.63% in the study area.

**Table 5. Extent of household food insecurity.**

Type	Percentage
Food insecurity incidence	29.6
Food insecurity gap	3.99
Severity of food insecurity	0.63

Source: own survey, 2014

### **Coping Strategies of food insecure households**

Maxwell (1996) classified household responses to food insecurity into two: coping strategies and adaptive strategies. Coping strategies are responses made by households to improve the declining situation of households food security while adaptive strategies involve a permanent change in the mix of ways in which food is required irrespective of the year in question and it refer to long term adjustment. For this study each household were interviewed the methods they used at the time of food shortage and cause of food shortage . Consequently, the main shocks listed by the households were: unusual high food prices; variation of product price or lack of market for their livelihood products , unemployment of a household member/s and death of family member. Accordungly, they adjust consumption pattern and use transfer based mechanism at the time of food shortage. The most frequently coping mechanisms given by households of each livelihood sector was based on reducing quantity of meal, reducing type of food items (reduce meal diversity), sending members to other relatives during severe food shortage, searching another job or migration to other areas where there is temporary job availability like coffee picking, borrowing from friends and relatives, selling assets and shifting to cheaper food items(Table 6).

**Table 6. Coping Strategies of food insecure households.**

Coping mechanism	N	%
Reduce quantity	3	10.3
Selling assets	6	20.7
Sending memebers to relatives	1	3.4
Shifting to cheaper food	5	17.2
Reduce frequency of meal	1	3.4
Borrowing cash and food items	10	34.5
Seasonal migration	3	10.3
Total	29	100.0

Source: own survey, 2014



### Determinants of Food Security

As it is indicated in the table below, out of 11 variables included in the model, four variables were found to be significant. The possible explanation of the variables are as follows:

Household size has negative relationship with household food security and statistically significant at  $p < 0.01$ . The odds ratio in the model estimation revealed that the probability of the households to move from food secure to food insecure increased by a factor of 0.478 as household size increased by one. The possible reason is that the age composition of the household in Jimma town is characterized with flat base which is high child dependent. This indicates that households with large family size, composed mainly of non-productive population (child and old dependents) could face the probability to be food insecure due to high burden on active labor forces in the study area. This finding is congruent with previous studies conducted by (Benjamin *et al*, 2012; Meskerem and Awol, 2013; Tilaye, 2004).

Income generated by the given household is positively related with household food security and statistically significant at  $p < 0.01$ . The odd ratio in favour of food security is increased by 3.93 as the households income increased by one ETB. The possible explanation is that income determines purchasing power of the household with the prevailing price so that those household in the respective livelihood groups having higher income periodically are less likely to become food insecure than low income households. This result is consistent with studies conducted by (Amsalu *et al*, 2012; Bogale and Shimelis, 2009).

**Table 7. Output of the logit model.**

Variables	B	S.E.	Wald	Sig.	Exp(B)
Constant	3.408	2.989	1.300	0.254	30.212
AGEHHH	-0.052	0.050	1.115	0.291	0.949
EDUCHHH	0.605	1.391	0.189	0.664	1.831
HHSIZE	-0.739	0.253	8.539	0.003	0.478***
LANDACCESS	1.003	0.933	1.157	0.282	2.728
CREDITACCESS	0.271	0.692	0.154	0.695	1.312
TRAINACCESS	0.288	0.804	0.128	0.720	1.334
ACCESSTECHNO	1.9	0.776	5.985	0.014	6.67**
SEXHH	.355	0.708	0.251	0.616	1.426
INCOME OFHH	1.369	0.521	6.899	0.009	3.93***
DEPENDRATIO	-0.194	0.424	0.209	0.02	0.823**
MARITALSTATUS	0.819	1.202	0.464	0.496	2.268
Chi-square					51.24***
-2Loglikelihood ratio					67.8
R <sup>2</sup> (Nagelkerke)					0.58
Observations					98

\*\* and \*\*\* significant at  $p < 0.05$  and  $0.01$ , Source: own survey, (2014).

The presence of dependents within the household is negatively related with household food security and found to be statistically significant at  $p < 0.05$ . The probability of shifting from food insecure to secure is decreased by 0.823 when the number of inactive age group is increased by one.

The possible explanation is that those dependent members create pressure on household consumption rather than productive activities. A household with more inactive labor force compared to the active age shows a high dependency ratio and it is more likely to be food insecure. This study is congruent with the previous studies conducted by ( Bogale and Shimelis, 2009).

Access to technology and household food security is positively related and found to be statistically significant at less than 5% probability level. The result of the model indicated that the odds ratio in favoure of food secure households are increased by 6.67 when the household head access to technology. This indicated that the role of technology access is crucial for household food security. As discussed by Kassie *et al* (2012), agricultural technologies can boost crop productivity , allowing for higher production and lower food prices, directly contributing to alleviate food insecurity: higher production and lower prices can support both self - consumption and household income.

## CONCLUSION

After multicollinearity diagnosis was undertaken, 11 variables were fitted into the model. The result of the binary logistic regression model revealed that out of 11 variables, four explanatory variables were found to be significant at less than 5% probability level. Accordingly, household size, income of households , access to technology and dependency ratio were found to significant. Household size was found to be negatively related with household food security. The main case behind is that as household size increase the chance of obtaining sufficient food decreases because large family size also one cause for the increment of the number of dependent members with in the household. Thus, action based awareness creation on the impacts of population growth at the family and community level should be strongly employed. Income of the household was found to be statistically significant and positively related with household food security. Therefore, searching and providing productive technical skill that make households in each livelihood groups competitive on the current market and generate income should be sought and promoted. Additionally, different marketing promotions such as bazar and exhibition should be facilitated so that they can introduce their produce and products. Dependency ratio is another factors that influences household food security negatively and statistically significant. Therefore, strategies that focused to support old age dependents should be devised. More importantly, the concerned bodies should pay attention to support those members of family that shoulder the dependents.

Access to technology and household food security were found to be positively related and statistically significant. Therefore, awareness creation for non-users of technology and encouragement of users should be enhanced to bring food security in the study area.

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