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FOOD INSECURITY IN SMALL URBAN CENTERS OF EAST GOJJAM ZONE, AMHARA NATIONAL REGIONAL STATE, ETHIOPIA

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Abstract

Food insecurity has become one of the daunting challenges that the urban areas of the developing countries have been grappling with. Small urban centers, in particular, have faced with a serious challenge of food insecurity. The present study aimed to identify the food insecure households and the determinants of food insecurity based on the household survey consumption data. Two-stage sampling technique was used to select the study towns and 328 households. Mean, independent sample t-test, one-way ANOVA and logistic regression were employed to analyse the data. The computed result from the survey consumption data revealed that over one-third of the surveyed households were food insecure while nearly two-third were food secure. This high incidence suggests the severity of food insecurity in these towns. The results further revealed that the incidence and severity of food insecurity varies among the study towns. The logistic regression result also showed that six out of the twelve regressed explanatory variables were found statistically significant determinants of food insecurity. Among the statistically significant variables; migration status of household head, acquired skills of household head, radio/television possession of the household and monthly income of the household have negative association with food insecurity while educational status of the household head and round trip distance from the source of drinking water point have positive association with food insecurity. It is therefore recommended that the local government should work on reducing the extent of food insecurity in the study towns by helping households to diversify their income sources. A productive safety net program launched in the major urban areas should also be scaled up.

Keywords: Determinants, Food insecurity, Households, Small towns

1 Introduction

Food insecurity is one of the pressing issues in the world. Countries are striving to achieve food security by 2030. This is reflected in Sustainable Development Goal Two. It says "End hunger, achieve food security and improved nutrition and promote sustainable agriculture" (UN, nd). According to FAO (2020), food insecurity is "a situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life". Food security has availability, access, utilization and stability components. Napoli (2011) indicated that food might be available but that does not determine access; similarly, access might be viable but does not guarantee utilization, and all three can be disrupted by lack of stability caused by climate change, conflict, unemployment, disease or other factors. Stability or instability can affect any or all of the other

three components (Napoli, 2011). Food insecurity is either chronic which can sustain a long period of time (more than three months) or transitory or short period of time/temporary (less than three months). The causes are lack of assets and inadequate access to productive or financial resources for the first and short-term shocks and fluctuations in food availability and access for the later (Napoli, 2011).

The results of food insecurity are famine and hunger (Napoli, 2011).The number of people affected by hunger in the world continues to increase slowly caused the greater number of conflicts and climate-related shocks (FAO, 2020). Sixty million more people are undernourished in 2020 than in 2014 (FAO, 2020). The figure will reach from 690 million in 2014 to 840 million by 2030. The same source revealed that the figure was 17.6% (250 million) in Africa in 2014, which was twice the world average (8.9%) undernourished people. Globally 750 million (9.7%) people were severely and 1.25 billion (16%) people were moderately food insecure in 2019 (FAO, 2020). These together accounted for 2 billion (25.9%) people. The same source revealed that Africa is the hardest hit with an estimated population of 675 million.

Despite the reported double-digit growth, the Ethiopian economy is among the most vulnerable in Africa due to the recurrent droughts (Bamlaku & Solomon, 2013, Alemayehu & Addis, 2016). In spite of this, hunger and food shortages were not in a policy discourse in Ethiopia until the Derg regime (Alula & Desalegn, 2013). Consequently, poverty and food insecurity are prevalent in Ethiopia. About 30% of the total population and 26% of the urban population of Ethiopia were absolute poor in 2010/11(CSA, 2011) and 10% of Ethiopian cities are chronically food insecure (Care, 2014) resulting from price fluctuations as 80% of urban households depend on purchased goods from different markets which is affected by high inflation as of 2005 (Bamlaku & Solomon, 2013; Alemayehu & Addis, 2016). Though they were not effective in reducing the problem; growth in food production, environmental protection, water management and irrigation projects, employment creation and resettlement were some of the government programmes in reducing food insecurity during the Derg (Alula & Desalegn, 2013). Due to this a major policy shift was made in 2003 by introducing food security programme (FSP) which incorporates Productive Safety Net Programme (PSNP) launched in 2005 in rural areas, Household Asset Building Program, Complementary Community Investment and Resettlement Programme (Alula & Desalegn, 2013; Berhanu, 2013). The extent of food insecurity in the country is escalating in the major urban areas, which is the cause for the beginning of urban productive safety net programme in the major urban areas in 2017.

The causes and coping strategies of food insecurity are different for different people and areas (Ramakrishna & Assefa, 2002). Little empirical evidences on the incidence and determinants of food insecurity are available in small urban areas so far. Any food security study in Ethiopia concentrated earlier on rural areas (Devereux & Sussex, 2000; Kedir, 2017; Alem-meta & Singh, 2018; Mebratu, 2018; Admasu et al., 2019) and later on the major urban areas (WFP, 2009a; WFP, 2009b; Yared, 2010; Ejigayehu & Endris, 2012; Girma, 2012; Bamlaku & Solomon, 2013). Studies of D'Souza and Jolliffe (2016) and Mesfin (2014) were on rural and small urban areas in which the results were not presented independently for the first and the size of the town is not indicated for the latter. The gap is that food insecurity is seen as a problem only rural and major urban areas are facing. However, it is also the problem of small urban areas, which equally needs government and researchers' attention.

The objectives of this study were to measure food insecurity and identify the determinants of food insecurity at the household level. The results of this study will improve the efforts of the government in reducing the problems of food insecurity and add knowledge to the existing literature by unearthing the problems of food insecurity. The rest of this article is organized by four major sections. The first section deals with the description of the study area. The second section presents methods and materials.

The third section entertains results and discussion. The last section contains conclusions and some recommendations.

2 Materials and Methods

2.1 Description of the Study Area

Location and Physical Setting

The absolute location of Felege Birhan is 11°88′ North latitude and 37°04′ East longitude (Figure 1). Relatively, Felege Birhan is found approximately 7*km* West of Addis Ababa-Motta-Bahir Dar all-weather gravel road in Enarj Enawga *Woreda*, 315*km* North West of Addis Ababa and 166*km* South East of Bahir Dar through Addis Ababa-Motta-Bahir Dar road. The exact location is 10°30′ North latitude and 37°45′ East longitude for Wojel and 11°42′ North latitude and 37°04′ East longitude for Yetmen. Relatively, Wojel is found along Addis Ababa-Debre Markos-Bahir Dar asphalted road in Awabel Woreda, 251*km* North West of Addis Ababa and 314 kilometers South East of Bahir Dar. Relatively, Yetmen is located along Addis Ababa-Motta-Bahir Dar all-weather gravel road in Enemay *Woreda*, 247*km* North West of Addis Ababa and 238*km* South East of Bahir Dar. All towns are found within the South East Woyna Dega Teff Livelihood Zone (Amhara Livelihood Zone Report, 2007). According to this report, this livelihood zone is a surplus producing zone with good road access.

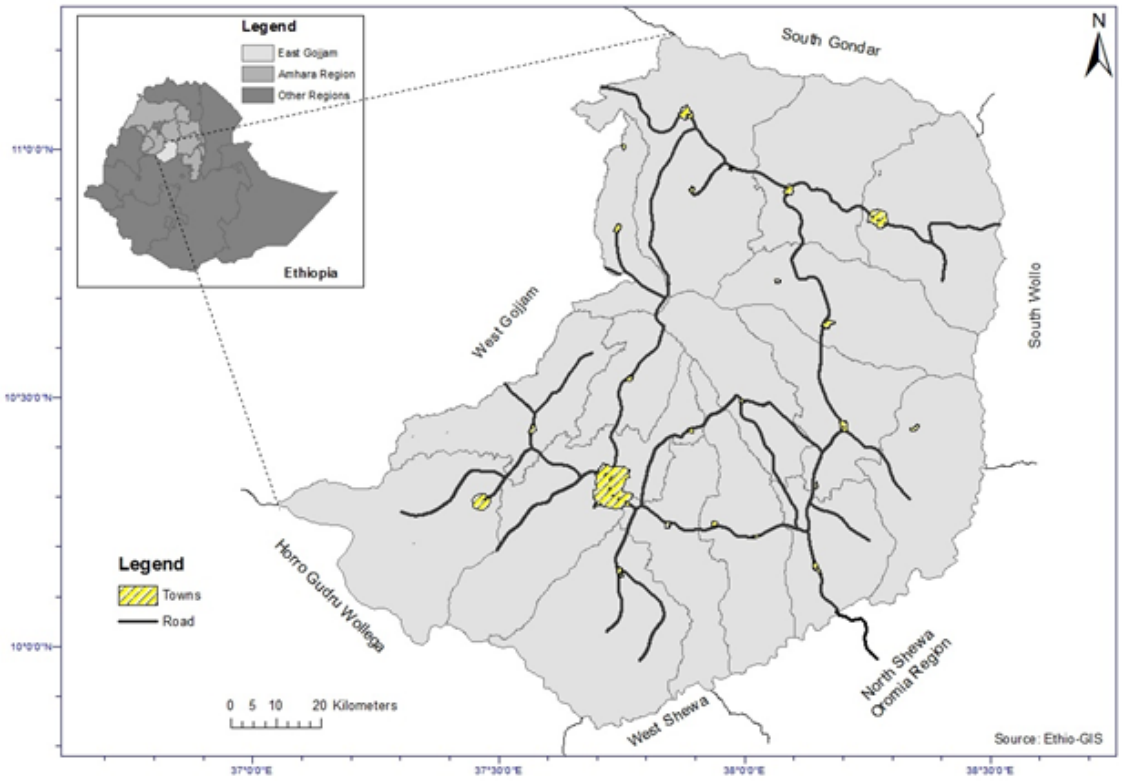

Figure 1. Location Map of the Study Towns

The altitude of Felege Birhan is 2790 meters above sea level (masl.). Its topography is not plain but rather rugged unlike the other study towns. The altitudes of Wojel and Yetmen are 1975 and 2425 masl., respectively. The topographies of Wojel and Yetmen are plain. The average annual rainfall of Felege Birhan is 1175*mm* and the monthly average temperature is 14°*C*. The climate of this town is cool

temperate (Dega). The mean annual rainfall and the mean monthly temperature of Wojel are 1158*mm* and 18°*C*, respectively. The town, therefore, lies within temperate (Woyna Dega) climatic zone. The average annual rainfall of Yetmen is 1063*mm* and the monthly average temperature is 16°*C*. The climate of the town is, therefore, temperate (Woyna Dega).

2.2 Demography, Economic Activities and Infrastructure

Based on the 2011 CSA data, the population size of Felege Birhan was 8197 of which 4000 were males and 4197 were females. The population size of the town accounted for 4.5% of the total population of Enarj Enawga Woreda and half (50%) of the total urban population of the woreda. The same source indicated that the population size of Wojel was 3176 of which 1492 were males and 1684 were females. The total population of Wojel accounted for 2.4% of the total population of Awabel Woreda and less than a quarter (22%) of the total urban population of the woreda. The CSA data further revealed that the population size of Yetmen was 3276 of which 1455 were males and 1821 were females. The total population of Yetmen accounted for 1.8% of the total population of Enemay Woreda and 14% of the total urban population of the woreda. People in all the study towns engage in different economic activities. Some of the major economic activities are retail trade, services (bars, restaurants and teashops), agriculture and handcrafts. The majority of residents of these towns engaged directly and indirectly in agriculture. Modern manufacturing industries are nonexistent in these towns. However, handcrafts such as weaving, pottery and carpentry are available.

During the field survey, all the study towns were in the same level of infrastructural provision and development. Felege Birhan was not crossed by any main all-weather road in contrast to the other study towns. Yetmen is crossed by Addis Ababa-Motta-Bahir Dar all-weather gravel road. Similarly, Wojel is crossed by Addis Ababa-Debre Markos-Bahir Dar asphalted road. The town was also connected with Lega rural market center through secondary gravel road. All the study towns had some other basic infrastructures such as education (one elementary and junior secondary school and one high school), health (one health center for each and private clinics), water supply (except in Wojel), 24 hour hydroelectric power supply, digital telecommunication and post agent. Above all, these towns had no basic soft infrastructures like banks during the field survey. Furthermore, these towns had no public amenities such as a sport field, a library, a public toilet, a waste disposal site and butchery and their associated services mainly resulting from the absence of a municipality in Wojel and well-functioning municipalities in Yetmen and Felege Birhan.

2.3 Study Design, Approach and Sampling

Quantitative research approach and cross-sectional survey design were employed for this study. This is because the approach helps to identify the explanatory variables by generating data drawn from a representative sample (Creswell, 2012). Primary and secondary sources were used to generate data. The primary sources were household heads and the secondary sources were books, journals and other published and unpublished materials. The target population of the study was 2230 households. It was 617, 621, and 992 in Wojel, Yetme,n and Felege Birhan, respectively. The lists of households were obtained from kebele administrative and health extension offices of each town. The list of households obtained from all towns were alphabetically arranged and renumbered. The sample size for the survey was determined by Kothari's 2006 formula. This method of sample size determination is known as determination of sample size through the approach based on precision rate and confidence level (Kothari, 2006). Mathematically;

$$n = \frac{(Z^2.p.q.N)}{(e^2(N-1)+Z^2.p.q)}$$

Where,
n is size of sample; p is proportion agreeing (0.5), q is 1˘p (0.5); Z is the value of the standard variate at a given confidence level (1.96); e is the desired margin of error (0.05) and N is total population (2230).

The calculated sample size (n) based on this formula was therefore 328 households.

Two-stage sampling was used to select the sample. The towns were selected in the first stage followed by households. The total number of non-capital small towns in East Gojjam was six. Out of these six small towns, three were purposively selected on the basis of their population size and location in relation to the main roads to see the effect of population size and road on food insecurity in these towns. The towns of population size greater than or equal to 2000 and towns located far from the main roads and along the main roads were selected. Thus, the selected towns on the bases of these criteria were Wojel (found along all-weather asphalted road), Yetmen (found along all-weather gravel road) and Felege Birhan (found far from all-weather road). In the second stage sample households were drawn from these selected small towns using a simple random sampling technique, specifically random number table, as this technique gives every member equal chance to be selected. A sample was selected proportionally by using the procedures of a simple random sampling technique from each town. The selected sample was 91, 91, and 146 households from Wojel, Yetmen, and Felege Birhan, respectively.

2.4 Survey Instrument

The household questionnaire survey was used for the study. Before the development of the questionnaire, focus group discussions were conducted on unstructured questions. These were valuable in the development of the questions and helped the researcher understand how people talk about the survey issues, which were helpful in choosing vocabulary and in phrasing questions. Focus groups can often suggest issues, concerns or points of view about the topic that the researcher had not considered (Ary *et al*., 2010). After this, a questionnaire with open and close-ended questions was designed. It was designed to generate demographic information, economic information, food consumption (7 days consumption data on thirteen food groups such as cereals, pulses, cereal preparations, oil seeds, vegetables, fruits, tubers and stems, meat, milk and milk products, sugar and honey, stimulants, spices and oils and fats), assets, and livelihood strategies. Ambiguities, misunderstandings and other inadequacies of the questions were identified and corrected using a pilot survey on 30 households. The pilot survey also helped to improve the reliability of the questions by repeating the same questions purposely. To ensure the construct validity, the questions were given to experts who were familiar with the research issues. The corrected questionnaire after the pilot test was administered using a face-to-face interview. This is because this method has a high response rate and is useful for respondents who do not read and write (Ary *et al*., 2010).

2.5 Data Processing Procedures and Analysis

Quantitative techniques of data analyses were employed in the study. Firstly, the numerical data were coded and entered SPSS version 20 software. Secondly, the data entered the software were cleaned using descriptive statistics to make it ready for analyses. Thirdly, the food security status of the households was measured. Daily calorie per adult equivalent was employed to measure food insecurity. This is a common measure of food insecurity, which is related to food access (D'Souza & Jolliffe, 2016). The predetermined adequate nutrition for a healthy or normal life by Ethiopian Nutrition and Health Research Institute (EHNRI), 2200 calories per adult person per day, was used. Households below and above this amount are food insecure and secure, respectively. Different individuals in a household have different needs. A young child typically needs less food or calories than an adult, and similarly, the need for women differs from men. There are also economies of scale in consumption. A large family size may benefit in price from bulk purchase (Haughton & Khandker, 2009). These differences in household size and composition were normalized or adjusted by using AE = (N adults + (0.7*N children below 15 years)) 0.8. AE refers to adult equivalent and N is a number. From the formula, 0.7 is the cost of a child relative to an adult presumably reflects the lower needs for food of children and 0.8 compares

the effects of economies of scale, which significantly reduce the size of large-size households.

After the calculation of AE using this formula, the daily per adult equivalent energy intake of households was calculated. The daily energy consumption for a household was determined using the quantity of food items obtained from households and the energy assigned to each food item taken from EHNRI (1997) food composition table. The amount of calories per 100 grams of some food items such as biscuit, spaghetti, macaroni, etc which were not available in EHNRI food composition table were obtained from the packages of the manufacturer of each food item. For the item consumed in different forms (raw and cooked) by the household, the average energy was used. The real daily food consumption per adult equivalent was computed from the seven days food consumption data. Firstly, the total quantity consumed within seven-day was divided by seven to find the daily food quantity consumed by the household. Secondly, this daily total quantity was divided by the adult equivalent size of the household including the guests to find the daily adult equivalent consumption assuming that if the guests are available throughout the week. Thirdly, the daily adult equivalent consumption was multiplied by the adult equivalent size of the guests and the number of days they consumed in the household in order to know the total food quantity consumed during their stay in the household. Then in order to get the households real consumption, this amount was subtracted from the total quantity a household consumed in seven days proportionally from the total quantity of each food item by assuming that guests consumed from every item the household consumed in the seven days. Finally, the real household's seven-day consumption was changed into daily per adult equivalent.

Lastly, mean and range were used from the descriptive statistics to measure consumption variation and t-test, one-way ANOVA and logistic regression were employed from the inferential statistics to test the variation of daily average calorie consumption and identify the determinants of food insecurity. All the necessary assumptions such as linearity, normality, multiccollinearity, hetroscedacticity were tested. Though the calculated sample size was 328, the analyses were made on 323 households because the food consumptions of five (1.5% non-response rate) of the sampled households were not properly filled.

The logistic regression model used is:

$$P(Y=1) = \frac{e^{(\beta_0+\beta_1X_1+\beta_2X_2+...+\beta_nX_n)}}{1+e^{(\beta_0+\beta_1X_1+\beta_2X_2+...+\beta_nX_n)}} \quad (1)$$

Where P is the probability of occurring the dependent variable Y, food insecurity, where 1 was assigned for the food insecure and 0 was assigned for the food secure households, e is the Euler number which is the base of the natural logarithm which helps for the transformation of the non-linear relationship of the dependent variable with the explanatory variables, β_0 is constant or the Y-intercept when X is zero and β_1, β_2, ... β_n are coefficients of the independent variables. Maximum-likelihood estimation was used to estimate the constant and coefficients of the independent variables. This could select coefficients that make the observed values most likely to have occurred (Field, 2005). However, the odds ratios (odd ratio or change in odds is the change in odds resulting from a unit change in the predictor) were interpreted instead of the coefficients as these are simple to interpret as the values are standardized. The odds ratios were determined after the odds of an event were calculated. The odds of an event occurring are defined as the probability of an event occurring divided by the probability of that event not occurring (Field, 2005). The odds of an event were computed using the model:

$$Odds = \frac{P(becomingInsecure)}{P(notbecomingInsecure)} \quad (2)$$

Where the probability of being insecure can be computed using equation 1 while the probability of not becoming insecure or $P(Y=0)$ is $1\check{}P(Y=1)$. The model of odds ratio is therefore:

$$OddsRatio = \frac{Oddsafteraunitchangeinthepredictor}{Originaloddsbeforeaunitchange} \quad (3)$$

The values of the numerator and denominator for the odds ratio were obtained through equation two before and after a unit change in food insecurity. The method of logistic regression used was backward: likelihood ratio since the purpose of logistic regression in this study is to explore the most important factors of food insecurity and the method is free of type II error (accepting the null hypothesis when it is false) as it identifies the most significant factor backwards rather than ignoring the insignificant one forward (Field, 2005). Indicator was the method of contrast employed as this is the standard dummy variable coding method and the zero coded categories were the reference categories for the categorical variables. Food insecurity is a dependent variable which can be explained by twelve selected factors for the present study. These selected factors were socio-demographic factors such as sex, migration status and marital status of the household head as well as household size that have positive association with food insecurity; the human capitals such as level of education, acquired skills and health status of the household head that have negative relationship with food insecurity; entitlement or economic factors such as monthly income, radio/television possession, agricultural land possession and savings of the household that have negative association with food insecurity; and roundtrip distance from drinking water point, which influences food insecurity positively.

3 Results and Discussion

3.1 Socio-Demographic Characteristics and Calorie Intake

Presenting and describing the demographic and socio-economic data are essential for any study in achieving the objectives of the research as these help in contextualizing the interpretation of the results to achieve the objectives. These demographic and socio-economic variables have either positive or negative relationships on the food insecurity status of households for this study. To show this average daily consumption of households per adult equivalent is presented with the demographic data. In connection with the description of these data, the mean daily calorie consumption of each category of each variable was analysed, and the variation of the average intake was tested using t-test and one-way ANOVA.

Table 1. Percentage Distribution of Household Heads (HHHs) by Sex and Calorie Consumption

Sex	Town						Total		Mean & *t*- value		
	Wojel		Yetmen		Felege Birhan				Total		
	Number of HHHs	%	Number of HHHs	%	Number of HHHs	%	Number of HHHs	%	Mean Daily Calorie	*t*	*p*
Female	24	26.4	24	26.7	48	33.8	96	29.7	3001.16	1.587	.11
Male	67	73.6	66	73.3	94	66.2	227	70.3	2751.98		
Total	91	100.0	90	100.0	142	100.0	323	100.0			

Source: Field Survey, 2014

As presented in Table 1, the majority (70%) of the surveyed households was male-headed and the remaining 30% was female-headed. The proportion of male-headed and female-headed households differs across the study towns. It was higher and lower than the study towns' average in Felege Birhan and the other study towns, respectively (see Table 1). The study further revealed that the mean daily calorie consumption per adult equivalent was 3001.16 for female-headed households and 2751.98 for male-headed households. The difference however was not statistically significant at the desired level. Most household heads in these towns are self-employed rather than government and private sector employed in which males are dominant than females. Females in small towns engage in petty trade like selling of

local drinks like tella and areki. These are the main sources of income for many female-headed households in the study towns. Besides, females are better in managing the household resource than males. Females invest their income to meet their family needs. They are not extravagant.

Regarding the age of the household heads, a third (33%) of the household heads were ages from 30 to 39 years followed by 40 to 41 years and 20 to 29 years accounting for 21% and 19%, respectively (Table 2). These three age groups together accounted for nearly three-fourths (73%) of the household heads. The share of the remaining age groups was relatively small. The age of a significant proportion (91%) of the household heads was within the productive age group while only a little proportion (9%) was within the non-productive age group. As depicted in Table 2, there was variation in the percentage of household heads in these age groups among the study towns. The average daily calories consumption per adult equivalent also indicated this reality on the ground. It was 2404.02 and 682.33 calorie per adult equivalent for ages from 15 to19 years and above 64 years, respectively. The average consumption of these age groups was lower than the other age groups (see Table 2). This is consistent with the study results of Mesfin (2014). He found that the average age of the food insecure households was smaller than the food secure households. Keeping other factors constant like health, huge proportion of households were headed by a productive age group that can at least sell their labour in order to meet the food needs of the households. In addition, this age group has better capacity to engage in income generating activities to meet the food requirements of the household. The consumption of households headed by old age groups was lower than the other age groups due to the fact that this age group has no ability to work long hours and engage in productive economic activities.

Table 2. Percentage Distribution of Household Heads by Age and Average Calorie Consumption

Age in Years	Town						Total		Mean & F- value		
	Wojel		Yetmen		Felege Birhan				Total		
	Number of HHHs	%	Number of HHHs	%	Number of HHHs	%	Number of HHHs	%	Mean of Calorie	F	p
15-19	0	0	1	1.1	0	0	1	.3	2404.02	.715	.638
20-29	19	20.9	12	13.3	30	21.1	61	18.9	2880.27		
30-39	22	24.2	28	31.1	56	39.4	106	32.8	2854.14		
40-49	21	23.1	22	24.4	25	17.6	68	21.1	2906.38		
50-59	15	16.5	13	14.4	20	14.1	48	14.9	2874.31		
60-64	7	7.7	5	5.6	5	3.5	17	5.3	2694.74		
>64	7	7.7	9	10.0	6	4.2	22	6.8	682.33		
Total	91	100.0	90	100.0	142	100.0	323	100.0			

Source: Field Survey, 2014

As depicted in Table 3, about two-thirds (66%) of the household heads were married followed by divorced which accounted for 21 percent. The proportions of single and widowed heads of households were very small. The percentages of married and divorced heads of households were almost the same across the study towns with little variations. The average daily calorie consumption of households by marital status of heads of households indicated some variation. The consumption was the highest for single household heads followed by divorced ones (see Table 3). One-way ANOVA confirmed that these

variations were statistically significant (F=4.886) at 0.002 level of significance. The consumption of households headed by divorced marital status was unexpectedly higher than households headed by married marital status. Though this needs further research this might be related to the length of divorce and recovery periods. Divorced household heads might recover from the shocks they faced through different strategies. These households might immediately invest their share from their former partner in a new livelihood strategy or meet their food needs by selling other assets. In addition, these households might use their human capital (assistance from relatives/friends), which has the greatest return to the household in meeting the food needs of the household.

Table 3. Marital Status of Household Heads and the Mean Daily Calorie Consumption

Marital Status	Town						Total		Mean & F- value		
	Wojel		Yetmen		Felege Birhan				Total		
	Number of HHHs	%	Number of HHHs	%	Number of HHHs	%	Number of HHHs	%	Mean of Calorie	F	p
Single	3	3.3	5	5.6	5	3.5	13	4.0	3425.06	4.886	.002
Married	59	64.8	59	65.6	94	66.2	212	65.6	2741.54		
Divorced	18	19.8	19	21.1	32	22.5	69	21.4	3194.64		
Widowed	11	12.1	7	7.8	11	7.7	29	9.0	2298.25		
Total	91	100.0	90	100.0	142	100.0	323	100.0			

Source: Field Survey, 2014

With regard to the size of the households, the household size of over half (55%) of the households were from 1 to 3 followed by 4 to 6 that account for 37 percent. The percentage of each household size category differs across the study towns (see Table 4). Though some differences were observed, the percentage of households with household sizes from 1 to 3 was over half of the households in each study town. The mean daily calorie consumption per adult equivalent in each household size category also differs. It was highest in the 1 to 3 household size group and lowest in the 7 to 9 household size group. The one-way ANOVA confirmed that the difference was statistically significant ($F = 5.086$) at the desired level of significance. This is consistent with the result of Mesfin (2014) on research conducted in the Amhara Region. He found that food insecure households have large household size (average 4.76) than food secure households (average 2.56). The same source revealed that large family size puts pressure on household consumption. Despite the availability of labour in large-size households, household size has a direct relationship with food insecurity. As household size increases, the tendency of households falling below the recommended daily calorie intake is high. These indicate that labours in these towns are not properly managed at the household level in order to diversify income sources and meet the minimum daily calorie consumption of the household. Large family size might have high dependency ratio if the human capital is not properly managed.

Table 4. Size of the Households (HHs) and Mean Daily Calorie Consumption

HH Size	Town						Total		Mean & F- value		
	Wojel		Yetmen		Felege Birhan				Total		
	Number of HHHs	%	Number of HHHs	%	Number of HHHs	%	Number of HHHs	%	Mean of Calorie	F	p
1-3	54	59.3	52	57.8	71	50.0	177	54.8	3031.59	5.086	.007
4-6	31	34.1	33	36.7	56	39.4	120	37.2	2583.39		
7-9	6	6.6	5	5.6	15	10.6	26	8.0	2546.70		
Total	91	100.0	90	100.0	142	100.0	323	100.0			

Source: Field Survey, 2014

Concerning the educational status of the household heads, 38% of the household heads did not read and write. Over a quarter (29%) of the household heads were grade 5 to 8 completed. The proportion of certificate and above holders was small (see Table 5). The percentage of each category of educational status of the household heads had some variations (see Table 5). Household heads who did not read and write were relatively higher in Felege Birhan and smaller in Yetmen accounting for 42% and 32%, respectively. The highest average daily calorie consumption per adult equivalent was for household heads who read and write was 3155.51 followed by grades 9 to12 accounted for 3004.48. The least was households headed by grades 1 to 4 completed which accounted for 2675.63 calories per adult equivalent. This shows that the variation has no pattern with the level of education and the variation in daily consumption was not statistically significant. This is against the findings of Mesfin (2014) that education has a negative relationship with food insecurity, that is, the increase in the level of education leads to a reduction of food insecurity. Education in these study towns did not generate income for the households because government institutions and private sectors that require the expertise of the educated individuals are absent. Households who produce food from their own agricultural land and off-farm activities are food insecure.

Table 5. Educational Status of Household Heads by Average Daily Calorie Consumption

Educational Status	Town						Total		Mean & F- value		
	Wojel		Yetmen		Felege Birhan				Total		
	Number of HHHs	%	Number of HHHs	%	Number of HHHs	%	Number of HHHs	%	Mean	F	p
Can read & write	32	35.6	29	32.2	60	42.3	121	37.6	2749.86	.559	.763
Not read & write	10	11.1	2	2.2	15	10.6	27	8.4	3155.51		
1-4	11	12.2	13	14.4	11	7.7	35	10.9	2675.63		
5-8	27	30.0	28	31.1	38	26.8	93	28.9	2828.55		
9-12	8	8.9	14	15.6	16	11.3	38	11.8	3004.48		
Certificate & above	2	2.2	4	4.4	2	1.4	8	2.5	2815.23		
Total	90	100	90	100	142	100	322	100			

Source: Field Survey, 2014

3.2 Food Insecurity Status

The existing food insecurity studies in the major urban areas of Ethiopia indicated that food insecurity is profound. A study of Ejigayehu and Endriss (2012) in Addis Ababa and WFP & UNICEF (2009) in the major urban centers of Ethiopia like Addis Ababa, Bahir Dar, Desse, Harar, Diredawa and others indicated that food insecurity status is over 40%. Table 6 below depicts the food insecurity status of the households in the study towns. As displayed in the table, slightly over a third (34%) of the surveyed households were food insecure while nearly two-thirds (66%) were food secure. Therefore, the proportion of food insecure households in the study towns was smaller than the major towns of the country. However, the percentage of food insecurity in the study towns was the same with the food insecurity status of urban areas of the Amhara region which accounted for 34.1% as studied by Mesfin (2014). The result indicates the high levels of food insecurity among the study towns. The incidence of food insecurity would have been higher than this if the data was not collected in the post-harvesting season where the price of the agricultural produces in this season is usually lower than the other seasons.

Table 6. Food Insecurity Status of the Households and Average Daily Consumption

Town		Status		Total	Statistics		
		Food Insecure	Food Secure		Min	Max	Mean
Wojel	Number of HHs	37	54	91	960.12	6758.71	2601.98
	%	40.7	59.3	100.0			
Yetmen	Number of HHs	32	58	90	1293.61	8483.37	2670.97
	%	35.6	64.4	100.0			
Felege Birhan	Number of HHs	42	100	142	578.33	9877.86	3067.91
	%	29.6	70.4	100.0			
Total	Number of HHs	111	212	323			
	%	34.4	65.6	100.0			
Mean Calorie		1671.08	3355.68				

Source: Field Survey, 2014

Though the figure in the present study was smaller than large towns and the same with the regional average, this proportion of food insecure households was very high since these towns are located in the surplus producing region. These households can buy agricultural products at a lower price than large towns and directly from the producers, so that these households might be benefited from the lower prices. In spite of the lower living cost in these towns, the high percentage of food insecure households in these towns might be due to the absence of employment creation in the study towns. According to Getaneh (2017), 90% of the households in these towns are self-employed. They engage in low-return businesses. Moreover, the livelihood of households might be undiversified and government and NGO interventions are rare. Seventy four percent of households in these towns depend on a single source of income (Getaneh, 2017). Lack of government intervention in small towns is another possible reason for the high level of food insecurity in these towns. Most development interventions of the government in urban areas are in large and intermediate size towns. For example, productive safety net programme was launched in the major towns only in 2017. The other possible reason for the high incidence of food insecurity in these towns is lack of resource management at the household level apart from the determinant factors identified through logistic regression. Above all, the high level of food insecurity is due to the high incidence of income

and multidimensional poverty, which accounted for 37.5% and 55%, respectively (Getaneh, 2017).

The above table also showed that the level of food insecurity varies across the study towns. The percentage (41%) of food insecure households in Wojel was higher than the other study towns accounting for 36% and 30%, respectively. The levels of food insecurity in Wojel and Yetmen were above the average of the study towns while the level of food insecurity in Felege Birhan was below the average of the study towns. The minimum daily calories consumption per adult equivalent was low in Felege Birhan which accounted for 578.33 calorie per day per adult equivalent followed by Wojel which accounted for 960.12 calories per day per adult equivalent. These results indicate the variation in the severity of food insecurity in these towns. This variation is possibly due to differences in road access. Felege Birhan is a pocket town where its residents have no livelihood strategy in connection with the road by providing services and goods for the travelers and drivers unlike the other study towns. The minimum consumption in Yetmen was 1293.61 calories per day per adult equivalent. This was higher than the other study towns. This implies that the cost of reducing food insecurity in Yetmen is lower than the other study towns. However, the average consumption was high in Felege Birhan followed by Wojel (see Table 6). The average kilo of calories consumption per adult equivalent in urban areas of the Amhara region as studied by Mesfin (2014) was 2424.15 and 421.46 for food insecure and secure households, respectively.

3.3 Determinants of Food Insecurity

The results of the logistic regression analysis indicated that out of the twelve explanatory variables selected only six variables were statistically significant. Out of these, two were socio-demographic variables such as migration and educational statuses of the household head; three variables were entitlements such as monthly income of the household, radio or television possession of the household and acquired skill of the household head, and one variable was infrastructure-related such as round trip distance from the source of drinking water points. The model is fit by any measure of the goodness-of-fit and correctly classifies 86.7% of the cases at the seventh step (see Table 7).

Table 7. Logistic Regression Results

	B	**S.E.**	**Wald**	**df**	**Sig.**	**Exp(B)**	**95% *CI*. for EXP(B)**	
							Lower	Upper
Migration Status (1)	1.859	1.022	3.307	1	.069	6.419	.865	47.620
Educational Status	.262	.138	3.637	1	.056	1.300	.993	1.703
Acquired skill (1)	-2.628	1.301	4.081	1	.043	.072	.006	.925
Radio/television Possession (1)	3.186	1.515	4.420	1	.036	24.184	1.241	471.410
Round trip distance from Water	.149	.048	9.872	1	.002	1.161	1.058	1.274
Monthly Income in Birr	-.002	.001	7.507	1	.006	.998	.997	.999
Constant	-4.140	1.827	5.137	1	.023	.016		
Model Chi-Square	42.377							.000
-2Log Likelihood	36.48							.001
Cox & Snell R^2	.507							
Nagelkerke R^2	0.693							
Number of Cases	323							

Source: Field Survey, 2014

As displayed in Table 7, the probability of households of migrant household heads being food insecure was 6.419 higher than households of the non-migrant household heads. This might be because of the differences in the capitals they have in the towns. That is, the non-migrants might have their own houses so that they are at least free from housing expenditure for sheltering and running home-based business and some of these households able to generate income from this through renting. Besides, households headed by the non-migrants might have better social capital such as idir and equb. These help these households in times of crises.

As demonstrated in the same table, the increase in one unit in the level of education of the household head increases the probability of food insecurity by a factor of 1.3 units. This is against the expectation that education has a negative relationship with food insecurity. Education in these study towns did not generate adequate income for the households because government institutions and private sectors that require the expertise of the educated individuals are absent. However, household heads with at least one of the skills such as carpentry, weaving, pottery and maintenance decreases the probability of being food insecure by a factor of 0.072. People with these skills in these towns have the highest probability of generating enough income to meet the minimum food requirements of the households. These household heads can generate income through manufacturing handicrafts and providing services.

The odds ratio in the possession of radio/television (source of information) indicated that a household with the source of information (radio or television) decreases the probability of food insecurity of the household by a factor of 24.184. These households could receive information related to food prices and marketing through radio/television. This might help them to maximize their profit from the livelihood activities they engaged in. In addition, a tape recorder and television in a service business in these towns are the means of attraction of their customers. This increases the number of customers and the length of time these customers spent, which in turn increases income. Income has an indirect relationship with food insecurity. The odds ratio of the monthly income of the households indicated that an increase in income by a unit reduces the probability of food insecurity of the households by 0.998 units. The odds ratio in round trip distance from the water points showed that a unit increase of the round trip distance from the drinking water points increases the probability of food insecurity by 1.161 units. Infrastructure for drinking water is not well-developed in these towns. These towns have no budget allocated for even the maintenance of this infrastructure. The source of drinking water for 40% and 5% of the households in these towns was a communal tap and an unsafe source, respectively (Getaneh, 2017). The increase in distance from the source of drinking water increases the cost and time in fetching water. The increase in the cost of water reduces the food to be purchased for consumption. The time taken in fetching water reduces the time to be used in income-generating activities.

4 Conclusion and Recommendation

Addressing food insecurity is a very serious challenge for many governments of the world. The present study attempted to measure household food insecurity. It also attempted to identify the determinants of food insecurity at the household level. It is therefore possible to conclude from the results of the food security measurement that the incidence of food insecurity in small towns is very high. Significant proportions of households in these towns are suffering from food insecurity, that is, they are not able to meet the minimum daily food requirements. The result on the minimum daily calorie consumption per adult showed the severity of food insecurity in these towns. However, the incidence and severity of food insecurity and the average calorie consumption per day per adult equivalent varies among the study towns due to variations in economic, social and administrative contexts. For example, Wojel had no municipality to provide services to their residents and Felege Birhan and Yetmen had no well-functioning municipalities so that food insecurity is severe in Wojel than in the other study towns. The lo-

gistic regression results also indicate that among the statistically significant variables migration status of the household head, acquired skills of the household head, radio/television possession of the household and monthly income of the household have negative association with food insecurity while educational status of the household head and round trip distance from the source of drinking water point have positive association with food insecurity.

The problem of food insecurity in small towns should be reduced using appropriate intervention programmes at different levels. If the problem is not addressed, the severe problem in small urban areas will have a profound negative effect on the existing efforts of the government in addressing the problem of food insecurity in the country in general and urban areas in particular as many smaller towns contain a significant proportion of urban population in the country. Food insecurity intervention of the government should not be limited to the major urban centers and rural areas. The productive safety net programme and other development programmes should be implemented in all urban centers. In addition, income source diversification, especially urban agriculture like dairy and poultry farming should be promoted in these towns in order to insure food security. Besides, the Woreda government should increase communal water taps in the town to reduce the time being wasted in fetching water. The regional government should establish a municipality for those which have no and strengthen the existing municipalities. Since this study is a cross-sectional study, longitudinal studies on small towns are needed to know the trends and seasonal variations of food insecurity in these towns.

End Note

Definition of local terms

Derg is a geez word which means committee and this committee rules Ethiopia from 1974 to 1991.

Woreda is an administrative area which is found between zone and kebele administrations in Ethiopia. It is equivalent to district.

Kebele is the lowest administrative unit, which is more or less equivalent to a county in Britain.

Tella and *Areki* are very alcoholic homemade local drinks made from different cereals and rhamnus prinoides.

Idir is a local traditional association for the purpose of assistance when a family member of the member of the association dies.

Equb is a traditional local association used for rotated saving of money.

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Conflict of Interest

The author declares that there is no conflict of interest.

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