

**RURAL HOUSEHOLD FOOD SECURITY STATUS: THE CASE OF LAELAY
MAICHEW WOREDA, TIGRAY**

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Abstract

The study was conducted in Tigray, Laelay Maichew woreda to assess food security status of rural households. Different concepts and empirical findings are profoundly organized and presented. Both quantitative and qualitative methods were used. The analysis was made from primary and secondary data. Multi-stage random sampling method was employed to select respective agro-ecologies, Administrative kebeles and households. Primary data were gathered using survey questionnaires, key informant interview, focus group discussion and observation. For the survey 150 (107 male, 43 female) households were used. While secondary data were collected from different published and unpublished materials. Data was analyzed using Household Food Balance Model (HFBM) and descriptive statistics. GIS also used for mapping of the study area. The result of HFBM analysis indicates 22.7% of the households achieved the daily recommended calorie intake/adult equivalent/ day (2,100 kcal) while, 77.3% households are found to be below the daily recommended calorie intake. The average calorie intake of the households covers only 56.2%. Based on the household head, female headed households are found to be more food insecure than their male counterpart. So, the government should exhaustively work on promoting irrigation, providing credit and subsidize the farmers in the area of agricultural sector to solve the problem of food insecurity. Moreover, the government should give due emphasis to female headed households to empower economically.

Keyword. Food insecurity, Household Food Balance Model, household, Tigray

Introduction

From the angle of international covenant on economic, social and cultural right, everybody has the right to be free from hunger and malnutrition in order to grow his/her physical and mental faculties fully (UN, 1974). The number of undernourished people is showing an improvement globally which fell from 868 million to 842 million (FAO, 2013). However, it needs strong effort to realize hunger reduction goals, particularly, in developing countries (Kyaw, 2009).

Various definitions are coined about food security, but the commonly used and accepted definition of food security is “when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life” (FAO, 2001: 4). In rare cases this definition might be achieved but majority of Ethiopian society could not meet. Due to this case food shortage is happening every year in Ethiopia.

Food insecurity in rural Ethiopia is devastating since 85% of the population livelihood is depending on conventional farming system and productive safety net. However, the degree of food insecurity varies across agro ecological zone even among the marginal low rainfall areas of the country. Nevertheless, Subsistence farmers, pastoralists and agro pastoralists represent large percent of the Ethiopian population with devastating food insecurity. Where, their daily intake is below 2,100 kcal per person and about 60 percent lives below the poverty line (FAO, 2001; 2010; Natsion, 2004). Moreover, compare to male headed household female headed households are exposed to food shortage. The positive association of female headed households and food insecurity is associated with; possession of low working power, most of the time they employed in informal sectors, higher dependency ratio, work burden and low access to productive assets (Degefa, 2005; Kantor & wood, 2012).

Tigray is among the national regional state of Ethiopia which is grouped under food insecure regional states with high levels of vulnerability caused by repeated shocks allied with diminished entitlements, low natural resource endowments and limited access to infrastructure. Since the late 1970s, the fragility of household economies in the region has increased in the face of eroded coping strategies and limited opportunities for income and employment. Consequently malnutrition, health impairment and asset depletion has pushed households further down the poverty ladder and placing them at risk of famine (Sgro & Naerstad, 2009). The Tigray region, where the study area is found, is drought and famine prone area; where the people mainly lead their livelihood through mixed farming system on the fragmented, over utilized land and affected by erratic rainfall (Webb *et al.*; as cited in Degefa, 2002).

Although, the *woreda* is food insecure and persistently benefiting from safety net program (WBoA, 2012), there is difference in the degree of food insecurity among households. So, considering this issue is also imperative as previous study conducted by Misgna (2010) in the area has methodological gap where the researcher employed safety net graduation benchmark as food security/insecurity measurement. This method involves measuring of wealth in terms of money. Such methodology does not show clear picture of household food security status. Along with above mentioned gaps female headed households are also the focus of the study. A long stand civil war in the study area during the socialist period and Ethio-Eritrea border

conflict made many households female lead. So, giving attention to female headed households and making comparison with male headed households is also valuable as previous study conducted in the study area do not address this. Therefore, the theme of this study is to; investigate the calorie available of rural households, explore the disparity of food security status between male and female headed households and coping strategies of rural households of Laelay Maichew *Woreda*.

Materials and Methods

Study Area

The study was conducted in Aksum National Regional State of Tigray 1024km north of Addis Ababa. It is a home to rugged and gentle slope arable lands with an elevation of 1200-2050 meters above sea level and average annual rainfall and temperature of between 550 - 750mm and 20-27^c respectively. Livelihood of the *woreda* is dominated by subsistence agriculture and petty trading, daily laborer, mining and other sources of income. According to *Woreda* Bureau of Agriculture (WBoA, 2009) average size of cultivated land own by household with five family sizes is about 0.75 ha. Teff, barely, wheat, horse bean, sorghum, finger millet and chicken pea are the major crops grown in this area.

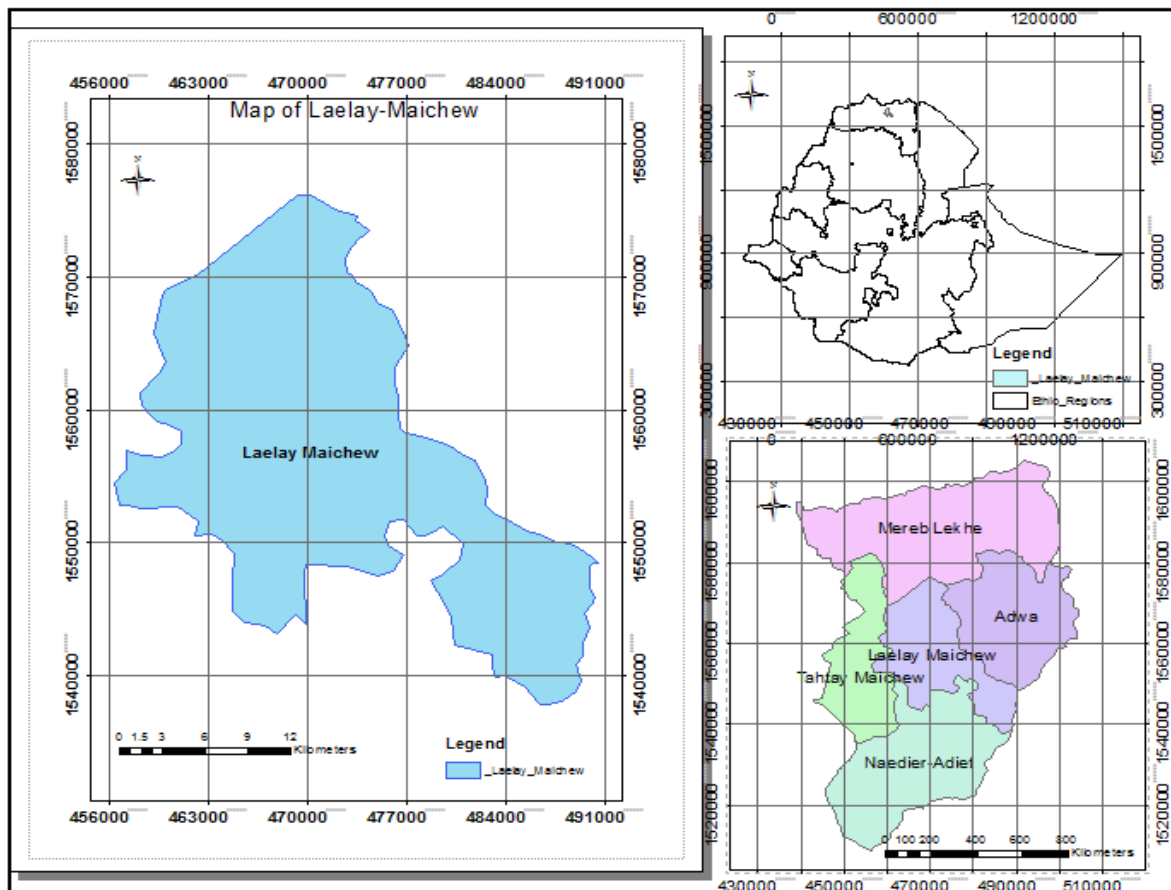


Figure 3: Map of the study area

Source: own sketch

Research Techniques and Sampling Method

A combination of qualitative and quantitative methodological approach is used to determine household food security status and the response experienced to shortage of foods in the real life. Both probability and non-probability sampling were used. The study area is selected purposely because of its seasonally or chronically food insecure, it has potential to irrigation, it has good potential for irrigation but still there is problem of food, relative convenience in infrastructures to collect data on time and it has diverse agro-ecological zones. Moreover, I grew up there and have valuable information about the life experience of the community, topography of the woreda and can entertain the regional language which is imperative to communicate easily.

Primary and secondary data were gathered. Primary data were collected through household survey, focus group discussion, observation and key informant interview, whereas secondary data were gathered from books, journals, articles and proceedings.

The population and units of analysis for this study were households in the *Woreda*. Multi-stage random sampling method was employed to select respective agro-ecologies, Peasant association and households. The *woreda* was clustered in to two agro-ecological zone *kola* (lowland) and *woinadega* (mid highland). One peasant association from *kola* and two peasant association from *woinadega* representative peasant associations were selected using simple random sampling. Taking the whole administrative kebele or more administrative kebele from each agro-ecological zone is simply squandered of time, money and other resources as far as the households inhabit in similar agro-ecological setups, have similar livelihoods and are believed to be homogeneous. Since the study considered both female headed and male headed households who are different attributes the households are also stratified in to female headed and male headed households to take representative sample from each household.

Data Analysis

Availability of food: According to UNEP (2002) food security has three basic dimensions namely, availability, access and utilization. To measure food security status of households considering these components is paramount, however, whether to measure all these components or not the situation of the study area matters. The leading determinant of food insecurity in the Horn of Africa is low levels of per capita food production. According to FAO (2001) food insecurity can be tackled most effectively through policies that promote agricultural productivity, rural incomes and food production.

For this study, food availability component of food security is used to measure food availability thereby food security status of households using Household Food Balance Model (HFBM). Since the study area has a serious problem of production compared to the other components of food security and the *woreda* is a beneficiary Productive Saftynet Program (PSNP) to achieve self sufficiency. Accordingly, total food production of each household was divided by the household adult equivalent to get the per capita food availability of household in kg. This kg was converted in to their respective kilo calorie using the FAO and EHNRI food composition tables. Finally, it was calculated as daily calorie requirement/adult equivalent /day. According to the Ethiopian government 2100kcal/adult equivalent/day or 225Kg of cereals per person per annum set as minimum acceptable weighted average

requirement (FDRE, 2001; MoFED, 2002). Based on this minimum daily calorie intake requirement, food secure and food insecure households were identified.

Model Presentation

For this study the model is adapted from Degefa (1996) and Messay (2009);

$$\text{NGA} = [\text{GP} + \text{GB} + \text{FA} + \text{GG} + \text{FW} + \text{MP} + \text{DP}] - [\text{HL} + \text{GP} + \text{GU} + \text{GS} + \text{GSE}]$$

NGA: Net grain availability (quintal/household/year)

GP: Total grain production (quintal/household/year)

GB: Total grain bought (quintal/household/year)

FA: Quantity of food aid obtained (quintal/household/year)

GG: Total grain obtained (quintal/household/year)

FW: Food for work (quintal/household/year)

MP: Total meat products (kilogram/household/year)

DP: Total dairy products (kilogram/household/year)

HL: Post harvest losses (quintal/household/year)

GU: Quantity of grain reserved for seed (quintal/household/year)

GS: Amount of grain sold (quintal/household/year)

GV: Grain given to others (quintal/household/year)

GSE: Grain used for social events (quintal/household/year)

These are the variables used in calculating this model.

Result and Discussion

Food Security Status of the Households

For this study, availability of grain is computed to measure household food security status using HFBM as presented in the above model. Food availability of households was calculated using calorie intake per adult equivalent to measure annual food adequacy of households. First, total grain availability per household is calculated and this annual grain availability is converted into its respective dietary calorie equivalent using the latest version of EHNRI and FAO (1968-97; 1995-97) food composition tables. However, type of model is more applicable to areas where their livelihood is depending on mixed farming system.

The study area has the potential for honey bee production, however; honey is not included directly while computing total annual grain availability and is not converted into its respective calorie equivalent. Because, honey is not incorporated in the food composition table and contributes insignificant amount in their daily consumption. Generally, all animal products are not included when calculating the total grain availability and not converted to their respective calories as they contribute insignificant in the daily household food consumption. Most of the time, households sell live animals and buy grains to fill the gap in grain requirements of their families as the focus group discussants implied.

Bluntly speaking, in developing countries like the area where the study conducted. The consumption of animal products is very small and even this small amount is consumed during festivity after a long period of fasting. That is why the contribution for their daily intake is considered to be insignificant.

Moreover, post harvest losses are considered as negligible and are not included in calculating the total grain availability of households. This is due to, the introduction of different types of pesticides, good awareness in post harvest losses prevention, control and traditional knowledge of the community therefore, post harvest losses are considered as insignificant. Except the aforementioned variables which are not included in computing total grain availability, the rest all variables are computed using the HFBM and are converted into their respective calorie equivalent using the EHNRI and FAO food composition table.

Out of the total surveyed households, 22.7% are food secure and the rest 77.3% are food insecure. This indicates that more than three-fourth of the households is exposed to critical shortage of food. For the purpose of lucid understanding of food security status and to have good portrait of households, households are grouped into three categories based on the calorie availability/adult equivalent/day. Food secure (≥ 2100 kcal/adult equivalent/day), moderately food insecure (≥ 1050 to < 2100 kcal/adult equivalent/day and severely food insecure (< 1050 kcal/adult equivalent/day). The mean daily calorie intake of the households is 1181.3 calorie which only meets 56.2% of the minimum daily requirement (2100 kcal). The minimum and maximum calorie intake is 103 and 3000 kcal respectively. So, the mean value falls under the category of moderately food insecure with incredible minimum and maximum daily calorie intake value. As Table1, indicates female headed households are the victim of food shortage compared to their counterpart male ship.

Table 1: Percentage Distribution of Calorie Availability of Households

Calorie availability/adult equivalent/day	Household head			
	Male		Female	
	Number	%	Number	%
FS (≥ 2100 kcal)	26	24.4	8	18.6
MFI(1050 to < 2100 kcal)	33	30.7	17	39.5
SFI (< 1050 kcal)	48	44.9	18	41.9
Total	107	100	43	100

Source: own survey 2013

Coping Strategies of the Households

Respondents were also interviewed, about the coping strategies they exercised at times of food shortage. It is not uncommon to experience different coping strategies during food shortage to minimize or avert the prevalence of asset depletion and other catastrophic impact. Result of the analysis discloses (Table 2) that large percent of the sampled households, employed as daily laborer whether in off farm or nonfarm activities. The key informants and focus group discussants said, although there is job opportunity in the study area, most of the capable bodies are fled to western Tigray during the weeding and harvesting season as per person daily wage is quite better than the wage of nearby towns. Daily laborer accounts 51.3% followed by eating less preferred foods and a combination of one or two coping strategies (selling wood, work as daily laborer, selling alcoholic beverages in village towns, mining and guarding schools, clinics etc), with a percent of 22% and 14.7%, respectively. Likewise, 3.3% of the respondents said reducing quantity of meals they eat, 2.7% borrowing

or purchasing on credit, 2% selling productive assets, 1.3% reducing number of meals and selling woods but consuming seed stocks and getting free aid (1%) are barely practiced this finding matches with the results of Misgna (2010) and Elias (2006)

Table 2: Percentage Distribution of Household Coping Strategies

Coping strategies	Frequency	%
Eating less preferred foods	33	22.0
Borrowing or purchasing on credit	4	2.7
Consuming stock seeds	1	0.7
Reducing number of meals	2	1.3
Reducing quantity of meals	5	3.3
Selling household assets	3	2.0
Selling woods and charcoal	2	1.3
Daily laborer	77	51.3
Aid	1	0.7
A combination of different coping strategies	22	14.7
Total	150	100.0

Source: own survey 2013

Conclusion and Recommendations

Based on the HFBM analysis, more than three-fourth of the households are food insecure. From this we could conclude that the prevalence of food insecurity in the area is precarious so, due emphasis should be given to the agricultural sectors, as livelihood of the community is depending on crop farming and livestock rearing. Therefore, proper strategy should be formulated in the area to increase domestic production and productivity, through introducing agricultural enhancing technologies like fertilizers, pesticides, irrigation and improved seeds in the crop aspect and honey bee production, poultry production and fattening in the livestock sector to solve the problem of prevalent food shortage. In addition to, the agricultural sector other enterprises should also expanded to host not employed households to generate income and to fill the gap in agricultural production.

Though the prevalence food insecurity is severe in the study area but, female headed households are mainly victim of food insecurity. Therefore, special attention should be given to female headed households to solve the problem of food shortage through introducing different packages which match with their physical capacity. The coping strategies practiced in the area is mainly daily laborer in off-farm activities. So, to solve this problem, the *woreda* bureau of agriculture should work strongly in introducing new packages to create job opportunity. Moreover, the regional government should formulate policies and establishes different enterprises to create job opportunities. Although, the attention towards female farmers is promising, still there should be strong strategies in place to support female farmers and the *woreda* agricultural bureau should seriously follow for proper implementation of the already designed strategies. Moreover, family planning should be also in place

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