



# Food Security and its Affect Among Rural Households Associated with Cooperative in Degahbur Woreda, Somali Region, Ethiopia: A Study

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## ABSTRACT

In Ethiopia it has been found that many international agencies, development agents, government sectors, individual donors have provided funds to address to meet food security needs and to reduce poverty. In this context the role of cooperatives may play a significant role to procure sufficient stable food at grass route level in which all households can participate to enhancing food security needs and to lead happy and healthy life. The objective of this study is to examine the determinants of household food security among the cooperatives members based on the data collected from 120 respondents selected randomly in Degahbur Woreda, Somali Regional State. The study utilized both primary and secondary data sources. Primary data collection involved structured questionnaire interviews and focus group discussions, while secondary data was obtained through the review of documents related to the cooperative's role in food security. The analysis of the gathered data was conducted using descriptive statistics and an econometric model, specifically a Binary Logit model. The study findings reveal that the status of food security among cooperative members is significantly influenced by factors such as the age of the household head, education level, total livestock owned by the household, and the sex of the household head. Additionally, households utilize various coping strategies during food insecurity, including the sale of firewood, charcoal, and livestock. The study findings suggest the necessity to enhance the educational level of cooperative members through education intervention programs and to boost livestock production and productivity by providing veterinary drug services, sustainable forage development programs, and enhancing the capacity of community animal health workers.

**Key Words:** Poverty, Development Agent, Education, Food in Security

## 1. Introduction

In Ethiopia it has been found that many international agencies, development agents, government sectors, individual donors have provided funds to address to meet food security needs and to reduce poverty. In this context the role of cooperatives may play a significant role to procure sufficient stable food at grass route level in which all households can participate to enhancing food security needs and to lead happy and healthy life. It was estimated about 795 million globally, continue to experience food insecurity, with a considerable portion residing in developing regions, notably in Africa. (Fao and WFP, 2015). According to (EC-JRC, 2015) in Horn of Africa, food security crisis aroused due to the impact of a powerful El Niño weather pattern, described as

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one of the most intense in the last two decades. As a result many people are displaced and became refugee experiencing food that posed challenges to meet food security needs.

In Ethiopia, prolonged drought conditions are severely affecting the production of staple food particularly in Deghabour in Somali region where cumulative rainfall was recorded up to 60 percent below average. Therefore, pasture and water availability have declined to extremely low levels, severely affecting crop production and livestock conditions leading to large scale animal death (FAO, 2018) and life and livelihood of pastoral community are palisaded. Thus country as a whole are in the brinks of food insecurity, studies found as nearly 33 million people are suffering from chronic undernourishment and food insecurity. (FAO, 2014). Thus the issue of food security needs poses a significant challenge for many individuals, policymakers, researchers, practitioners, and scholars. In mitigating this challenge, certain cooperatives are playing a crucial role in improving food security by empowering their members socially, economically, politically and other means but it requires more to focus.

There had been many studies like (Bezabih, 2009), (Berhane, 2013) and (Abiyot, 2010) tried to investigate the role of cooperative on food security in analyzing the role of cooperative in areas of food security and their perception of cooperative members towards the contribution of cooperatives on food security. Household food in security can be considered as food insecure when it has no access to basic livelihood resources, when it is highly vulnerable to external

shocks, and when the government system excludes it from development and in decision making process. These needs include adequate food, health, and shelter, minimal levels of income, basic education and (Devereux and Maxwell, 2003). People are food secured when they have access to sufficient, nutritious food for an active and healthy life. Food insecurity exists if one or more of these conditions are not absent. Further, different levels of household asset building must be considered if the underlying causes are to be effectively understood (Drimie and Mullins, 2006). People are food secured when they have access to sufficient, nutritious food for an active and healthy life. Food insecurity exists if one or more of these conditions are not absent. Further, different levels of household asset building must be considered if the underlying causes are to be effectively understood (Drimie and Mullins, 2006).

According to them, it provides access to credit services, agricultural inputs, and marketing services, thereby enhancing productivity and reducing food insecurity among members. Through business models that are resilient to economic and environmental shocks, cooperatives create stable rural employment opportunities and contribute to sustainable food security. Cooperatives are pillars for agricultural development to sustain food security needs and play a crucial role in reducing poverty and healthy life (Bezabih, 2009). Cooperatives promote and support entrepreneurial development, productive employment creation, raising incomes to reduce food insecurity, helping to reduce poverty while enhancing social inclusion, social protection and community-building (Smith et al., 2006). Many developing countries have taken and improved cooperatives as a development strategy that empowers communities to exit from poverty (Develtere et al., 2008; Emanu, 2009). But it needs to address more focusing on to identify the factors influencing households' food security and role of cooperatives to extend supports in this regard. Therefore, this study is an attempt to find suitable solutions to provide better life and livelihoods to the people in fulfilling food security needs in a better way.

## 2. Materials and Methods

### 2.1. Descriptions of the Study Area

The study was conducted in Degahbur district of Jarar Zone, Somali Regional State, Ethiopia, from April 2023 to October 2024 (Figure 1). It is located at 8°13' North of longitude and 43°34' East latitude at the distance of about 160 km south of Jigjiga town. The altitude of the district is 1044 meters above sea level. It has a mean annual minimum and maximum temperatures of 11°C and 33°C, respectively. The mean annual rainfall and humidity of the area range from 300 to 400 mm and 31% to 36%, respectively. The rainfall pattern is erratic and has uneven distribution. The farming system in the area is primarily pastoralists, who mainly keep livestock, particularly goat, camel, cattle, and sheep; and to some extent crop (like sorghum and maize) production is also practiced in the district. According to Central Statistical Agency, the total human population of the

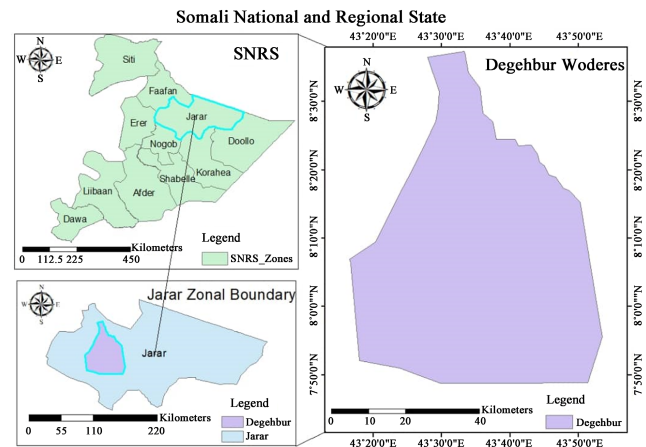


Figure 1: Study area map

Source: www.google.com

district is estimated at 150,000 of whom 85,000 are men and 65,000 are women.

### 2.2. Research Design

The study was concerned with assessment of the determinants of food security of the household among cooperative members. A cross-sectional study was made to investigate the determinants of food security of household among cooperative members by collecting data from randomly selected respondents at a single point in time.

### 2.3. Source and Methods of the Data Collection

This paper is based on the secondary data to be collected from secondary source such as pastoral community development document, rural development policies and strategies and document of ministry of agriculture and rural development policy documents, different published documents about rural cooperative document

#### 2.3.1. Tools and Methods of Data Collection.

A structured questionnaire was utilized to collect data from the study respondents. The questionnaire was designed based on the research questions and a review of related literature, focusing on the determinants of food security among cooperative members. Enumerators in the field were trained to understand the study objectives. Secondary data are information collected by governmental and non-governmental organizations for different purposes. Secondary data also helps gain better understanding of the issue under study before getting into the fieldwork. Key informant interviews were conducted to gather information on the community profile and the food security situation of the Woreda. The informants included cooperative leaders. Focus group discussions were held in the study communities, with participants representing cooperatives. The focus group included individuals from various villages, households of different economic backgrounds, and both genders to ensure gender balance.

### 2.4. Sampling Methods

Sampling Technique and Sample Size play a crucial role in research studies, with the appropriate sample size being dependent on various factors such as time, cost, and the desired level of accuracy (Gupta, 2002). In a study conducted in a purposively selected area, three Kebeles were randomly chosen from those where cooperatives are present. The sample size calculation was based on Yamane’s formula from 1967, which is suitable for simple random sampling as it provides an equal chance of selection to all cooperative members ( ).

$$n = \frac{N}{(1 + N(e)^2)} \tag{1}$$

Where:

- (n) is the sample size
- (N) is the number of households
- (e) is the level of precision.

According to the selected members of cooperative in Degahbur district, the total household of cooperative members were 520 members those are currently in operation. A 92% confidence level, with  $e = 8\% = 0.08$  the level of precision measures how close an estimate is to actual characteristics in the population which are inserted into the equation  $n = \frac{520}{1+260(0.08)^2}$  then calculating the denominator will

Therefore, the sample size n is:  $n = \frac{520}{1+260(0.08)^2} = 120$

### 2.5. Method of Data Analysis

After collecting data, it was edited, tabulated , coded and decoded and processed for analysis using suitable statistical tools and techniques in SPSS and STATA-25 software.

## 3. Results and Discussion

### 3.1. Socio-Economic and Demographic Characteristics of the Respondents

Age is an important demographic characteristics of the household assumed to bring food insecurity difference among households of cooperative members. The average age of the sampled household heads was 45.89 years (SD= 12.041) with minimum and maximum of 29 and 68 years respectively. The average age of food insecure household heads was 48.81 years (SD=13.762) whereas it was 41.80 years (SD=10.480) for food secure household heads.(Table 1)

### 3.2. Education Level of the Respondents

Frequency and percentage distribution of the respondent by educational level Education level of the household head Frequency Percentage Cannot read and write 37 (61.7%) Can read and write 28 (46.7%) Attended grade (1-4 th) standard 9 (15.0%),Attended (5-8th Standard) 10 (16.7%) Attended( 9-12 th Standard) 10 (16.7%) College diploma and above 12 (20.0%).(Table 2)

**Table 1:** Age wise distribution of respondents for food security and in security

Age of HH	Num-ber	Mean	Std. de- viation	Max	Min	Total %
Food secure	25	41.80	10.480	55	29	41.66%
Food inse- cure	35	48.81	13.762	68	27	58.33%
Total	60	45.89	12.041	68	27	100%

**Table 2:** Education level of the respondents.

Education level of the household head	Frequency	Percentage
Cannot read and write	37	61.7
Can read and write	28	46.7
Attended grade 1-4	9	15.0
Attended 5-8	10	16.7
Attended 9-12	10	16.7
College diploma and above	12	20.0

**Table 3:** Food security Status of the households

Food security status of the households	Mean	Std. devi- ation	Max	Min
Food secure	1229.032			
Food insecure	1737.2709			
Total	2037.6036			

### 3.3. Food Security Status of the Sample Households

The food security status of the sample households was assessed by comparing the calorie intake per adult equivalent per day with the minimum recommended amount of 2100 kcal. Among the cooperative members surveyed, 25 households were classified as food secure, while 35 households were identified as food insecure. Results presented in (Table 3)reveals that the mean per capital calorie intake of the sample household was 2037.6036 kcal, which is lower than the minimum required amount of kilocalorie which is 2100kcal. The average calorie intake among the food secure and food insecure sampled households among cooperative members were 1229.032 (which is higher than the minimum requirement per adult per day to live active and a healthy life) and 1737.2709. Kcal per AE per day respectively.

### 3.4. Family Size of the Respondents link with Food Security and Insecurity Condition.

The survey data indicates that among the respondents, households with a family size greater than 6.6 accounted for 12 (48%) of food secure households and 21 (60%) of food insecure households. On the other hand, households with a family size less than 6.6 represented 13 (52%) of food secure households and 14 (40%) of food insecure households. This suggests that larger family sizes in the study area are associated with a higher likelihood of being food insecure. The variable of family size is crucial in understanding the impact of cooperative services on food security, particularly in relation to credit services, as larger families may have higher consumption needs that require

**Table 4:** Family size of the respondents to link food security and insecurity condition.

Family Size	Food secure		Food insecure		Total	
	Freq	%	Freq	%	Freq	%
6.6	12	48%	21	60%	33	55%
6.6	13	52%	14	40%	27	45%

Source: Own data, 2024

**Table 5:** Income generating from the cooperative(Year 2020-21)

Income from cooperative	Mean	St. deviation	Maximum	Minimum
Food secure	1650	550	1800	657
Food insecure	818.7	283	1200	575
Total	1250	387.8	1500	387

**Table 6:** Food Aid support services for the respondents.

Food Aid	Food secured		Food insecure		Total	
	Freq	%	Freq	%	Freq	%
Yes	32	64	23	32.9	55	45.8
No	18	36.0%	47	67.1%	65	54.2%

additional income from cooperatives, which may not always be sufficient.(Table 4)

The participants of the focus group discussions highlighted the negative effect of family size on cooperative services and food security. Larger families struggle to manage income efficiently from cooperatives due to unplanned expenses related to family needs and living conditions, leading to poor utilization of cooperative services. Additionally, a 37-year-old man shared his experience, stating, "My family size is only four members; I got credit from the cooperative and used it to buy farming items, seeds, and materials. After using the income efficiently, I was able to pay back the money".

### 3.5. Cooperatives Role for Supporting Income Generating of the Respondents.

As shown in (Table 5) about income generating from cooperative, it shows that the mean income of respondents in 2020/21 from cooperatives was 1250 Birr. The mean income for food secure households was 1650 Birr with a standard deviation of 550, while for food insecure households, it was 818.07 Birr with a standard deviation of 283. This indicates a significant variation in income among the respondents

### 3.6. Food Aids Support Services for

Sustainable Food Security Needs. 45.8% of the sample household heads 32(64% of the food secure and 23(23% of the food insecure) were receiving food aid while 65(54.2% of sampled households 18(36% of the food secure households and 47(67.1% of the food insecure) were reported that they were not receiving food aid (Table 6).

### 3.7. Cooperative Role in Providing Training in Fulfilling Food Security Needs of the Respondents.

Table 7 shows that 54(45%) of the respondents had asserted that they received training from the cooperative or

**Table 7:** Food Aid support services for the respondents.

Training provided	Food secured		Food insecure		Total	
	Freq	%	Freq	%	Freq	%
Yes	30	60	24	34.3	54	45
No	20	40	46	65.7	66	55

local government bodies. 66(55%) of the respondents had some type of training . This implies that the cooperatives or concerned local government bodies had not provided the necessary training to cooperative members in order to be able to use resources efficiently and effectively for the sake of improving their income and their saving habit.

### 3.8. Household’s Food Insecurity Coping Mechanisms

About 88(73.3%) of food secure and insecure households were borrowing cash or grain. Therefore, Borrowing cash or grain is the main coping mechanism employed by food secure and insecure (both)households during critical times in the study area.Livestock serve as a store of value that can be converted into cash to meet the immediate needs of the households. The findings of the study reveals that 83(69%) of the food secure and insecure (both) households were engaged selling of livestock and was the second common activity that household use as a coping mechanism.(Table 8)

Remittance is the third most important strategies which used by food food secure and insecure (both) household during food insecurity condition to escape from the negative impact of food insecurity. The findings of the study reveals that 62(51.7%) of the food secure and insecure (both) households were getting income from outside/inside relatives in kind of remittance.(Table 8) Therefore, Remittance and was found to be the third common activity that household use as a coping mechanism.The fourth most important coping strategies used by large number of households those are among cooperative members were Seeking alternatives or additional job, were about 48(40.0%), for food secure and insecure (both) households respectively(Table 8)

### 3.9. Factors Affecting Households Food Security

Binary logistic regression model was used to identify determinants of food security of the among cooperative in the study area. The result of the model revealed the relative significance of demographic, socio-economic and institutional factors to food security. Livestock holding in tropical livestock unit of the respondents positively affected households’ food security at a level significant level of 0.05. The Education status of the household head was found to have a negative and significant relationship with food insecurity at a 5% probability level.an increase in education was associated with decrease in food insecurity.

Table 9 also shows that the age of the household head this variable is found to be positive and significant at 5 percent probability level. The positive sign is an indicative of its influence in the food security status of the rural households. This means that, an increase in the age of the household head increased the likelihood for the household to be food

**Table 8:** Household coping mechanisms to secure food security needs.

Number	Household coping mechanisms	Food secure		Food insecure		Total
		Number	%	Number	%	
1.	Borrowing cash or grain	34	68.0	54	77.1	88(73.3% )
2.	Sale of more livestock than usually	29	58	54	77.1	83 (69%)
3.	Remittance	26	52.0%	36	51.4%	62 (51.7%)
4.	Seeking alternatives or additional job	19	38.0%	29	41.4%	48 (40%)

**Table 9:** Logit model outputs of determinants of food insecurity

Independent Variables	Estimated coefficient	S.E	Wald	Sig. level	Odds Ratio Exp (B)	95% C.I for EXP (B)	
						Lower	Upper
AGE OF HH	1.164	.537	4.701	.030*	3.202	1.118	9.171
EDUCATION	1.631	.858	3.616	.057*	.196	.036	1.051
FS OF HH	.229	.382	.360	.548	1.257	.595	2.657
REMITTANCE	.606	.376	2.600	.107	1.833	.878	3.830
FOOD AID	.599	.497	1.451	.228	1.820	.687	4.822
DS	1.257	.572	.152	.696	1.250	.488	3.202
Credit	.162	.441	.115	.585	2.240	.376	5.756
Constant	-4.176	1.195	12.213	.000	.015		

Note: \*\*\* and \* significant at 10% , 5% and 1% probability level  
 Source: Binary logistic regression model output, (2024).

insecure. One possible reason may be that older household heads have larger number of family size as polygamy is a common practice.

This opens up a chance for bearing children even at latter ages. The other possible reason is that a household which headed by older aged head face a family labor shortage since old children become independent having their own household. And due to this the household would be composed of young aged children with large family size. The odds ratio of 3.202 implied that, other things being constant, the odds ratio was in favor of being food secure increased more than 2.899 times as age of the household head increased by one year. The possible reason for such result might be the old age bearing of children so that the family number increases while the head of the household was getting older and older. The result is contradicting with the earlier finding of (A bebaw, 2003).

## 4. Conclusion and Recommendations

### 4.1. Conclusion

The study aimed to investigate the determinants of household food security among cooperative members in the Degahbur Woreda, Somali National State. The findings revealed that the mean per capita calorie intake of the sampled households was below the minimum required amount, indicating a food security challenge in the area. Factors such as the age of the household head, livestock ownership, education level, and gender of the household head significantly influenced the food security status of households among cooperative members. The study underscores the importance of addressing these determinants to improve food security outcomes in the region.

### 4.2. Recommendations

Based on the study findings, several crucial recommendations are proposed:

- Rural households in the study area predominantly use traditional hand tools for cultivation. To enhance their livelihoods, it is recommended to introduce modern farming techniques such as using oxen and new technologies. This can be achieved through training programs and sharing experiences with other farmers.
- Further studies should be conducted in other districts of the region to validate the findings and develop comprehensive food security policies that benefit residents in the Somali Regional State and the country as a whole.
- Policy makers should focus on projects like family planning to address the high dependency ratio and large family sizes, which can contribute to food insecurity. Awareness programs on integrated health and education services are also recommended to prevent future food insecurity.
- Cooperative management should provide training to all members to enhance financial management and skill development. Monitoring and evaluation systems should be strengthened to assess the performance of cooperative members effectively.

### Conflict of Interest

Authors declares there is no conflict of interest involve in publishing this paper.

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