

# Determinants and Consequences of Food Insecurity (The Case of Loma Bosa District, Dawro Zone)

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**Abstract:** This study paper assesses causes and consequence of food in security as well as its determinants in Dawuro zone with in particular reference to Loma Bossa District. It was focus on hindrance factors of food security mainly with large family size, fragmented farming land, illiteracy and use tradition farming method in Loma Bossa District. The studied data requires collecting reliable information regarding food insecurity; data was collected from both primary and secondary data source. The primary data was collected from those individual which are highly affected by food insecurity through structured questionnaires. Regarding secondary data was collect from different research papers that have do on food in security and also the data was collect from relevant institution such as Loma Bossa district and Dawuro zone agriculture and rural development Office as well as published and unpublished data sources.

**Key words:** Determinants, Consequences, Food Insecurity, Case, Loma Bossa

## 1. Introduction

Since agriculture is the back bone of Ethiopian economy, the largest number of population depends on farming .Agriculture has multifaceted contribution as a source of input for industrial sector as a source of export as well as most important to provide sufficient food for increasing number of a population. It is generally known that Ethiopia with diversified agricultural resource which are considered to adequate and favorable for development of agriculture and achievement of food security, has not managed to be food self-sufficient. It is large agricultural labor force, land livestock, ample water and other resource which expands the potential food production but has failed to produce enough food. Food insecurity incorporates low food intake, variable access to food and vulnerability of livelihood strategy that generates adequate food in time of good but not resistant against shocks.

These out comes correspond broadly to chronic, cyclical and transitory food insecurity all are endemic to Ethiopia. The main triggers of food in security in Ethiopia are drought and rainfall seasonality is the major cause of food in security. Structural factors contracting to chronic food in security include poverty, which can be cause and consequence (Befekadu and berhanu, 2000:176).

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Ethiopia has structurally food deficient since at least 1980, in which the food gap rose from 0.75 Million ton 1979/80 to 5 Million tons in 1980/84, falling to 2.6 Million tons in 1995/96 deposited record harvest (IBID). Food insecurity in Ethiopia is derived from dependence on undiversified livelihood based on low input low output rain agriculture. Ethiopia farmers done to produce enough food even in good rain fall year to meet consumption requirements .Since agriculture is the oldest traditional practice of people of Loma district in Dawro zone and largest proportion of the people food consumption depend on agricultural sector. The largest proportion of land cultivated in the woreda by small house hold. However, the agricultural system that takes place in the district is not sufficient enough to feed the population of the District.

Loma Bosa is one of the vulnerable areas in Dawro zone where significant size of the population is suffering from food in security. The extent of vulnerability and food in security of the population of the District can be observed from unbearable burden of natural and man-made calamities should shouldered by the District, and subsequent Socio – economic situation of the district. Even though, Loma Bosa District is the beneficiary of agriculture the trend of food insecurity growth at higher alarming rate.

Loma Bosa district agricultural and rural development office pointed out that causes of food crisis in the district is sever and Complex, but there is no clear information about the food insecurity in the district, due to no available research did in the district. The significance of the study was to get clear information about the cause of food insecurity, Socio – economic consequence of food shortage, the limitations in solving the problems of food insecurity, the method alleviating the problem of food insecurity in Loma Bosa. The main objective of the study was to asses determinants and consequences of food insecurity, the case of Loma Bosa district, Dawro zone, Southern Ethiopia. The specific objective was to identify the factors that affect food security, to identify the major cause of food shortage, to identify Socio- Economic consequences of food shortage, to forward conclusion and recommendation.

## **2. Methodology of the Study**

### **2.1. Data Sources**

This research used both primary and Secondary Sources of data. The primary data was gathered from a population of selected farmers in the district. Secondary data was gathered from published and unpublished documents about the problem as well as from relevant institution such as Loma Bosa district agricultural and rural development office. In addition to this secondary data would be gathering from different research papers that have been done on food insecurity.

### **2.2. Methods of Data Collection**

The primary data of the study has been collected using self-administered and structured and interviews. This type of questioner is selected due to the following two reasons: - First, it is structured to design question as per the data need of the research and to minimize respondents' biasness.

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Second, it is self-administered and interview so that it is possible to translate question and help respondents to easily understand and provided intended response. On the other hand, the secondary data will be collected by referring to different published and unpublished documents.

### **2.3. Sampling Techniques and Sample Size**

The types of data employed were both primary and secondary data. Secondary data has been collected from different publication and unpublished document. Primary data has been collected through randomly selected house hold by interview questionnaires. Researcher himself collected the survey data. The sample size was determined using the Cochran's Formula (Cochran, 1977).

$$n = \frac{Nt^2pq}{Nd^2+t^2pq}$$

Where, n = Sample Size, N = Total Household Numbers, t = Abscissa of the normal curve, p = Proportion of sample of population estimated, q = 1 – p, d = Margin of error Fifty out of the total 592 households were selected for the semi-structured interview at 95 percent confidence level with 96 percent expected rate of occurrence at a reliability of ±5 percent. Group discussions with local people including elderly people, women and disadvantaged people were carried out to get more information on the subject. Regarding to questionnaires, the sampling has been made with a size of 90 farmers were taken as a center of investigation which believes to share their socio-economic variables commonly and it is economically convenient.

### **2.4. Method of Data Analysis**

The study was deceptive, which is a process of collecting, organizing, summarizing, into and presenting of both primary and secondary data having qualitative nature. The data that are collected through close ended questionnaires would be described by descriptive statistics that presented by in percentage computation and tables were employed. The SPSS software used to analyze the data by frequencies method.

## **3. Result and Discussion**

### **3.1 Socio – Economic conditions ( Situation)**

As many studies indicate, in Ethiopia, small holding or family farms provide almost all the agricultural output, and employ large number of population. The low productivity of the society is linked with the size of land holding illiteracy of the society and the mechanisms of production their engaged in

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Table 4.1 The educational level Sample units

Educational level	Illiterate	1-4	5-8	9-12	Attending of higher education Level	Total
Sample unit	24	14	9	3	0	50
Percentage	48	28	18	6	0	100

Source: - own survey, 2020

The fragmented land, with growing population of the country applying small scale and traditional agriculture system on this fragmented land and rain full farming practices have failed to produce food and contribute to poverty reduction and national food security.

The above table implies that mass of population are illiterate. As the table express, 48% of the population is illiterate, i.e. they cannot write and read. 28% can only attended grade ranged from 1-4 and 6% of them only Attended grade ranged from 9-12(high school). Its overall implication is that the studied farmers felt that their low level of education has adversely affected their production, which is manifested in their poor and traditional performance. Most farmers are illiterates, this in turn, leads the farmer to use resources. Improperly and insufficiently. so that , these and others leads to food insecurity.

Another indicator of low productive performance of the society is family size on which the zone has recorded the highest average family size of 8 person per house hold. The family size for the selected respondents was found to be between 5-10 person per house hold.

Table 4.2 The number of respondents on family size

Family Size	Sample Unit	Percentage
1-5	18	36
5-10	25	50
Above 10	7	14
Total	50	100

Source: - Own survey, 2011

The above table shows that 50% of the respondents answered that their family size ranged between 5 to 10 persons per house hold. In addition some respondents said that one person marries two or more than two women in district and each house ruled by one husband. Therefore it is possible to understand how much difficulty, it is to feed this high family size with in one house hold by only one family heads of which most of them are children as well as they are unable to produce adequate food for their basic needs .

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### 3.1.1 Employment Opportunity and Source of Income

Agriculture is the dominant source of income of people living in rural area of Dawro zone. The result of population census in 2000 E.C shows that 90 percent of the total population lives in rural area while the remaining of percent reside in urban areas.

And have the employment opportunity of the people in one way or the other mainly depends up on agriculture.

Although reliable records are not available discussion in the woreda food security office indicates that some persons are traders participate in petty trading such as grain and livestock. Their supplementary economic activities to cover the growing food shortage as a result of farm in adequacy and disaster induced to cover the growing headed households and house wives also engaged in petty trading such as kocho and cabbage manly on market days in their locality because of partially survive of food insecurity that area.

Table 4.3 The economic activities of sample unit

Economic activity	Sample Unit	Percentage
Agriculture	35	70
Trade	6	12
Daily work	5	10
Civil servant	0	0
Other paid activity	4	8

Source: - Own survey, 2020

As the above table show that almost all of the respondents engaged in agriculture in addition to this some of them are working in trade activities, those who have better education a skills compare to others they involve in daily works and other paid activity to generate some more income for their family. But all agriculture system is their main stay of their subsistence way of living.

### 3.1.2. Land Holding Size

Land holding size is considered as a critical production factor that determines the type of crop grown and the size of crop harvest. In Loma Bosa district, mainly farmers developed farm land through clearing forests and adding for graze land.

Moreover, due to population pressure the size of land owned by each house hold is declined over time. The problem seems very serious in highland (Dega and woinadega) climatic zones. This is mainly due to high population pressure (Density) and high irregular topography of the high land areas than kola. Thus, holding are larger in kola agro – ecological zone as compared to that of the daga and woinadega areas for instance, the available data obtained from AWADO indicates that in the kola area land holding ranged between 1-1.75 hectares. In contrast the range in the woinadega area is 0.5-1 hectares.

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Table 4.4 the sample respondents on land holding size.

Size of land holding in hectares	Number of sample unit	Percentage
0- 0.25	7	14
0.25- 0.75	12	24
0.75-1.5	16	32
1.5-2.00	11	22
Above 2	4	8
Total	50	100

Source: - Own survey, 2020

In addition the available data shows that the average land holding of the rural household in Dawro zone is 0.78 hectare of which 0.64 hectares is farming land and 0.4 is grazing land. The average land holding in Loma Bosa district is 0.65 hectares. The size of land holding discussed in the table, tells us that 14% of the Sample unit have land size of 0.25 hectares per household, 32% have between the class intervals 0.75 to 1.5 hectares and only 8% have above 2-hectars per household. These Shows farmers have no sufficient land in comparison to their house hold members' size. So that, it is impossible to attain their food sufficiency in Loma Bossa district. Food Security sufficiency Therefore, under subsistence agriculture, holding size expected to play significant role in influence from households' security. And hence, even if animal product keeping is also their important source of food, there have no significant private grazing land.

As 64 % of the respondents answered, they have a private grazing land below 0.25 hectares. In addition most farmers use low technical base for animal production in breeding watering in providing health care. All these negatively treat the society food security.

Table 4.5 Land size employed only for grazing

Land size employed only for grazing	Number of sample Unit	Percentage
0-0.25	32	64
0..25-0.5	10	20
0.5-1.0	6	12
1.0-1.5	2	4
1.5-2.0	0	0
Above 2	0	0
Total	50	100

Source: - Own Survey, 2020

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The table below indicates that almost all population used traditional and small scale farming system, using their animal power. As 54% respondents reflect, they use both hand and oxen for ploughing. And 30 % of small holders in the study area use their hand or stick for threshing their crops, especially for their important crop like maize and wheat. Also animals power used for threshing of crops 12% of the respondent use oxen / horse food and 46% use hand and oxen, horse for threshing.

Table 4.6: the farming mechanism of HHS

Type of plough tools	Sample Unit	Percentage	Type of threshing Tools	Sample Unit	Percentage
Hand dug	9	18	Hand / stick	15	30
Oxen	14	28	Oxen / horse foot	12	24
Both hand dug and oxen	27	54	Both hand and oxen	23	46
Both oxen and mechanized tools	0	0	Using mechanized tools / oxen , horse	0	0
Mechanized tool only	0	0	Mechanizes tools only	0	0
Total	50	100	Total	50	100

Source: - Own survey, 2020

Note: - HHS – house holds

The other problem in the study area, as well as, in the zone the prevalence of crop disease and insufficient provision of agriculture service to the farmer in the right time. That is even it supplied at a time, it is not distribute on time as a result in puts study in the storage. Furthermore in some remote and underdeveloped kebeles, the supply of fertilizer and other input is low due to weak infrastructural set up (especially road).

Table 4.7 agricultural production services

Agricultural Services	Sample unit	Percentage
Private (other farmer )	12	24
Government	34	68
NGOS	4	8
Total	50	100

Source: - own survey, 2020

According to the same respondents, there is prevalence of crop disease in the area. These diseases reduce the total yield from crop production and their value in the market and in turn it causes shortage of food. The study area seriously suffers from insect pest and others.

In addition from the above table 68% of the respondent replied their get agricultural service from government institution and 24% receive assistance from private / other farmers by agreeing to replay by

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additional amount in the next harvest time. and only 8% of them get service from NGOs, this shows that there is no significant number of NGOs in the study area as well as in the zone.

### **4.1 Climatic Conditions / Agro Ecological Zones**

Dawro Zone encompasses three agro – ecological Zones. Namely: - Kola, Dega and woinadega covering 7, 25, and 68 percent of the total surface area of the Zone respectively.

Rural house holding are reliant open “Belg” and “Meher” traditional production seasons depending on their agro-ecological zone.

The Daga areas predominately cultivate Belg crop while the kola areas more reliant up on Keremt rain and subsequent Meher harvest. Households in woinadega grow both Belg Meher crop. In a good year the rain will began in February and households will harvest in June. The Meher rains will take place between June and September and the majority of crop will be harvested in November and December.

Loma Bosa district is almost made up of two ecological zone, Daga and woinadega. Nature and type of rainfall is bimodal but erratic and sometimes inadequate and hence, uneven rain fall distribution is observed in general.

The average temperature of the area is 20°C in lowlands and 12°C in high lands. The altitude of the area ranged from 800m to 2600m while the agro – ecology is 8 % high land 68% midland and 24% low land.

#### **4.1.1 Rain fall and crop production**

Agriculture is the oldest traditional practice of the people of Dawro zone and the largest proportion of the people engaged in the sector. The largest proportion of the land the area is cultivated in the region by small households. The area is known by its production of maize, wheat and barley as well as produces some cash crop such as garlic and other food crops. Since small holder subsistence farming is the base of the economy of the zone, farming is almost excessively rain fed and production can be categorized as mixed farming so that cropping goes hand to hand animal husbandry.

The main rain season of the zone is summer (keremt) and the area gets its maximum rain fall during this season .At the time of good rain fall distribution there is agricultural production and vice versa.

As the result of these unevenness, in sufficiency and rain full of unwanted time affected production of the output and this leads to shortage of food crop and make the people to depend of food aid. Generally, rain has major impact on crop yield variability in addition to backward agriculture practice and unskilled labor as well as population pressure leads to decline of soil fertility which in turn leads to seed with low yield.

In Loma Bosa district, crop production activity has been carried out in two main production seasons, Belg and Meher. The major crop in Belg season are barely, bean and wheat and relatively in small proportion pulses on average area of 26.5 percent of the total cultivated land while the rest 73.5 percent is covered by Meher crop . Crop production in the Dega area is highly dependent on the Belg season barely



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harvest. The production failure of this crop severely affects the life of house hold living in the Dega agro ecological zone. The major crops cultivated in Meher season are, Barely, maize, wheat and pulses.

Agriculture in Dawro zone is generally rain fed. However there are few areas where irrigation is practiced. The data obtained from AWARD office reveals that there are water resource ( rivers and streams ) in the woreda that have a potential to irrigate of land thus, the area irrigated by individual farmers is very small when we compute it against the average land holding in the woreda.

### **4.1.2 Land degradation and Conservation Measures**

SNNPR integrated food security document for the year 1998-2002 indicates the most of the region is topographically rugged. Unfortunately most of these rugged mountains have been intensively farmed for a long time. As a result, the land is degraded. Each year agricultural yield decline by 10% percent as result of erosion (AWARDO).

The major reasons identified for environment degradation are topographic factor, climatic factors, grazing and number of population. And also shortage of rain and lack of follow up are the main problems which highly affect the growth of planted forest seedlings and thus limit the effectiveness of afforestation program.

### **4.1.3 Pre and post-harvest crop losses**

Pre and post-harvest crop losses caused by insect pests, diseases and weeds climatic and natural hazards (uneven erratic distribution of rain fall stream, flood) and storage pest have contributed match to the decline of agricultural production that brought about food insecurity in study area coupled with the problem of land degradation and limited infrastructure. The study area serious suffers from insect pest and weeds (such as porthenon hystophrous). Plant diseases also contribute significantly to decline production per unit area. Pre- harvest crop loss caused by insect pests and diseases, weeds and other climatic and natural hazards for different years is summarized in table below Although pre harvest crop loss in Loma Bosa District shows declining trend, for instance from 58.2 percent pre harvest crop loss which means more than half of the expected production had been lost before harvest. With regards to post – harvest loss caused by storage pests ( such as weevil ) poor threshing and storage facility there about on estimated 15 percent crop loss as stated by AWARD office crop protection expert during discussion on post-harvest crop loss.

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Table 4.8 pre harvest crop loss in Loma Bosa district for Year 2004/05-2007/08

Cropping Year	Expected production from the total cultivated land in quintal	Pre hoarsest crop loss	
		In Quintal	In percent
2004/5	328626	191416	58.2
2005/06	340629	186431	54.7
2006/07	269451	122938	45.6
2007/08	246422	104582	42.4
Average		151342	50.2

Source: - LBDARD office various year's crop assessments report

### 4.1.4 Productive Assets / Resources

Moreover, Befekadu and Berhanu classified households experiencing storage of draft animals and cash to buy seed and fertilizer food insecurity even though, data are not available on other components of productive assets in this subtopic we will look at plough oxen ownership position of households in Loma Bosa district.

Table 4.9 plough oxen ownership of house hold in Loma Bosa district

No of Oxen	No of HHS	Percentage from the total HHS
Only 1 oxen	10,005	31.7
Only 2 oxen	4,420	14.1
More than 2 oxen	1,009	3.2
Total	15,434	49

Note: - HHS house holds

Source:-LBDARD office

The total number of house hold in Loma Bosa district is 31,540. Among these, only 31.7 percent have one oxen, 14.1 percent of the district house hold have their own plough oxen while 51 percent do not have their own oxen.

### 4.2 Socio – Economic Consequence

Although recorded data are not available on socio – economic consequences of serious disaster food shortage, survey under taken and stated by LBDARDO during discussion held indicated / identified the main consequence were Hunger and human diseases, cattle loss and human death. sale of productive assets , migration and family separation begging shortage of farm inputs sale of wood and dependency.

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### 4.3 The Role of Government

The main sources of agricultural credit service in Loma Bosa district were government financial institution especially micro finance institution is one of the beneficiaries from this intuition. As we have seen in the previous section, pest attack is one of the contribution factors to the decline of food production in the study area. In time of serious pest attack chemicals have been distributed to farmers. In addition to this veterinary professionals provide vaccination to protect animals from diseases.

Including these activities and other such as forest seedling and improved animals' distribution accomplished by the government in Loma Bosa district. As part of the SNNPR strategies to Loma Bosa district, its agricultural development objectives are summarized below in table from year 2006-2010.

Table 4.10 major agricultural activities accomplished from 2006-2010 by the support of government

Agricultural activities	Unit
Pesticide	
-Liquid	6,906 liters
-Powder	1,608kg
Vaccination	
-Cattle	158,359
- sheep and goat	25,552
Livestock (on credit )	
- Milk cows	16
- Sheep and goat	804
- Calves	10
Seed distribution	
- Forest	19,051,000
- Coffee	172,247
-Fruit	41,623
Poultry co sale	1120

Source: - AWARO office

## 5. Conclusion and Recommendation

### 5.1 Conculusion

From finding of the study agriculture has played great role in the social and economic aspect of people by creating employment opportunities and supplying food even though agriculture is the base for peoples economic and social life its productivity is low. This is because most of farmers are illiterate and use low technical base for production. In addition in the study area poor infrastructural development is another factor for low productivity of agriculture. More over the presence of large house hold size with poor kills and most of them are children and fragmented land also negatively treat the society's food security.

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Peasant Household in Loma Bosa district relies on two traditional crop production seasons; Belg and Mehere. The kola area is dominantly reliant up on Mehere harvest while Dega area reliant on Belg harvest.

As we have seen in detail relying on one production season coupled with the problem of rain fed agriculture has made house hold highly prone to disaster induced food shortage in bad years.

Due to population pressure, the size of land owned by each house hold is declining overtime As a result , the steep areas which are not recommended for farming purpose, are put to cultivation.

This problem with topographic vulnerability of the area, climatic factors and over grazing are identified as the reason for environmental degradation of the study area. This in appropriate land use practices have great role for the decline of crop production and deforestation is one of the major problems.

Pre and post-harvest crop losses caused by insect pests and diseases climatic and natural hazards have contributed much to the decline of agricultural productivity brought about food insecurity in Loma Bosa district. For the period considered there is so on average 50.2 percent per harvest crop loss and also post-harvest crop loss is estimated to be 15 percent.

Agriculture is the dominant source of income of the people living in rural area of Dawuro zone. Because of limited opportunities for off employment in the study area, house hold migrates to other areas in search of way employment.

Thus, disaster related food shortage in Loma Bosa district have resulted in serious socio-economic problems such as hunger and human diseases cattle less and human death of productivity assets migration and family separation, begging shortage of farm inputs sales of wood and dependency on food aid.

Finally the paper tried to look at measures taken by the government and NGOs to improve the problem of food insecurity. As matter of the fact the government in the study area engaged in activity of supplementary feeding by item and cash on hand like safety net program. Moreover, in times of serious pest attack, chemicals have been distributed free of charge.

### **5.2 Recommendation**

The agricultural sector is one engine of our economy it contributes much for the future growth of the country. Nearly all of the population of Ethiopia either directly or indirectly depends on agricultural food on all part of the country. Thus, the improvement and modernization of agriculture through different measures will enable the country to be self –sufficient in food based on the discussion made throughout this paper and observed food insecurity problem in the study area, the following recommendation are forwarded.

- Attention should be given to intensive farming in order to increased productivity per unit area through provision of agricultural in puts (such as fertilizer, appropriate improved seeds, oxen, improved farm implements, etc) .
- Promoting agricultural extension based on water harvesting techniques and providing technical support to improve the traditional irrigation system in order t use existing water resource potential efficiently through small scale irrigation scheme.

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- Besides physical and Biological conservation measures creating awareness and developing skills among peasant house hold to protect soil from erosion is very important.
- The government and other concerned bodies should give attention to promote in come generation activities (diversification of source of income) through creating micro enterprises in rural areas.
- Provision of intensive training of agriculture to development agents and farmers (that is, development of human resource capacity)
- Development of infrastructure such as rural and feeder roads for promoting agricultural development.
- The government has to design land – use policy and implements in order to minimize the current unwise utilization of land.
- Initiate diversification of production capacity of the Loma Bosa district.

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## **Declaration**

I the undersigned declare that the Research paper for my original work and all material used for this study have been acknowledged.

## **Data Availability**

The data used to support this study are available from the corresponding author upon request.

## **Conflicts of Interest**

The authors declare that they have no conflicts of interest regarding publication of this paper.