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Extent and Dynamics of Food Insecurity: The Case of Smallholder Farmers in Assosa District, Western Ethiopia

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Abstract: Most of the African countries including Ethiopia are often characterized by problems of food insecurity. Despite several efforts made so far to improve the overall food insecurity situation, the challenge is still prevalent problem in Ethiopia. Hence this study was conducted with the specific objectives of examining the extent and dynamics of food insecurity in Assosa District, Western Ethiopia. In order to realize these objectives, data were collected from 138 randomly selected households in four randomly selected kebeles of the District. Besides, data was collected using household survey, focus group discussions (FGDs), and key informant interviews. Data was analyzed using food consumption score (FCS) and qualitative analysis. Based on world food program to calculate the food consumption score (FCS) results of food group, out of total respondents 81.16 percent of food insecurity household were poor food consumption groups. The other remaining 7.25 percent and 11.59 percent of food security households were borderline and acceptable food consumption group, respectively. This indicated that the extent of food insecurity of the households is high because most of households were found poor food consumption group. The result shows that between 2018 and 2019 food secure households declined from 42% to 38.41%, and food insecure households increased from 58% to 61.59%. Between 2020 and 2021, the proportion of food secure households declined from 21.74% to 18.84%, whereas the proportion of food insecure households increased from 78.26% to 81.16%. In year 2019, foods secure households declined by 3.59% and food insecure households increased by 3.59% from past year. While in 2021, foods secure households declined by 2.9% and food insecure households increased by 2.9% from 2020. This result shows the trend in food insecurity that shows increment from year to year due to unstable seasonal rainfall and climate change. Food security issues at the Assosa district require more in-depth and continued study outputs and proper use and implementation of the information gained as the area are found to be influenced by several, interlocked and site specific dynamic that, of course, require immediate and coordinated attention from different stakeholders.

Keywords: Food Insecurity, Dynamics, Extent, Households, Food Consumption Score, Qualitative Data

1. Introduction

1.1. Background of the Study

The series of food crises of Africa in 1970s and 1980s have led to continued interest in the various factors that influence peasant food security base [14]. Ethiopia has been the largest recipient of food aid in Sub-Saharan Africa [7]. Large proportion of the population has been under nourishment over the past one and a half decades. Although the proportion of the population in under nourishment reduced from 69 percent in 1994/95 to 35 percent in 2013/14 [7], it still remains at an undesirable level.

The major causes for the slow growth rates of agriculture include various factors such as unfavorable climatic conditions, undeveloped infrastructures and predominantly traditional production system. Ethiopia lies within one of the main food insecure countries in the world, with a huge number of its population living at survival levels and dependent on farm production extremely vulnerable to severe droughts. The smallholder farmer sector is the most important farming sub sector in the country. The production capacity of food grain yields as per capital food production has shown unbelievable location throughout the 1980s thus causing in sever food shortage in the country. The attention on large farms and western technology in agricultural

policies for national food sovereignty has meant that rural economic development has been neglected [9]. Many rural households by this time lost their means of living due to recurrent drought and yield failures. This, therefore, calls for measures to systematically address the problems of food insecurity in the country.

Dione J [3] shows that food security is an earning issue, either in the form of one's own food productions or from non-agricultural activities such as employment to get food through the market. The primary objective of the millennium development goals by the United Nations, conceived at the threshold of the new millennium in 1990s, was to ensure individual development for all [8]. The goals were the eradication of poverty, hunger, and generation of more employment. The evaluation of the outcomes of the decade long global efforts has provided evidence that the United Nations has only partially been capable to achieve these goals. This has necessitated the creation and implementation strategies for sustainable development goals 2, which is slated to be achieved by 2030 [8].

Ethiopian governments and international donors are applying different kinds of responses to food insecurity to achieve food self–sufficiency and minimize food aid dependence [10]. Regardless of large resources financed each year by the government and its companions to decrease food insecurity, both chronic and transitory food insecurity problems continued at the households' level [5]. In fact, the general food security situation has highly deteriorated in different parts of the country particularly in Assosa (Disaster Risk Management and Food Security Sector, 2019).

The prevalence of food insecurity and related vulnerability is generally high in rural parts of Ethiopia, where 79% of the population live [11], with rain-fed subsistence farming dominating agricultural production. Droughts are extended even to formerly rainfall adequate areas and leading to reduction in productivity and crop yield loss [2]. According to [12] most of the severe food crises were caused by a combination of several factors and are often interconnected. The most common causes of food insecurity in the world were: poverty trap, lack of investment in agriculture, drought, agricultural problems, climate change, war and displacement, unstable market and food wastage. Similarly, [6] food security strategy acknowledges the multifaceted and complex nature of food insecurity in Ethiopia. The adverse climate change, combined with high population pressure, environmental degradation, technological, and institutional factors have led to a decline in the size of per capita landholding causing a severe food insecurity problem in the country [6]. Assosa district faces with extreme soil erosion due to in appropriate farming practice coupled with cultivation and overgrazing of hillsides and steep slopes [15]. Soil erosion leads to reduce soil fertility which in turn reduces agricultural production. Therefore, of all the challenges facing Ethiopia, ending chronic food shortages and rural poverty and achieving enhanced livelihood and long-term food security in an environmentally and socially sustainable manner is the most pressing agenda for the country [4]. A district could be included in the Productive Safety Net Program (PSNP) when confirmed by experts that there prevails chronic food insecurity situation.

AZDoPED classified Assosa District as one of the food insecure districts found in West Ethiopia in 2019. Based on data obtained from AZFS-DPPO (2018), due to recurrent drought, the number of food aid recipients in the District increased from 25 thousands in 2015 to more than 40 thousands in 2018/2019. According to the same sources, the District is becoming the most food insecure area, demanding food aid for more than 21% of the populations. Furthermore, the cycle of drought, famine and distress is widely increasing in the study district. Off-farm and non-farm chances to improve the livelihoods of farmers and their families are restricted. With ever-increasing number of population and recurrent drought, the household food security circumstances is deteriorating in the study area.

1.2. Statement of Problem

In Ethiopia food shortage has aggravated the already poor economy of the country. Both chronic and transitory problems of food insecurity are widespread and severe in both rural and urban areas of the country [1].

In Assossa woreda the decreasing size of farm has led to a shorter fallow periods and even continuous cropping, and restricted efforts to recycle crop residues or organic matters in to the soil. These have resulted in costly investment by smallholder farmers in chemical fertilizer so as to produce enough for their survival requirement. Based on data obtained from AZFS-DPPO (2018), Assosa woreda is categorized as a chronically food deficit district of west Assosa zone (personal communications). As a result a substantial food aid is distributed annually during several drought years. Agriculture in the rural part of Assosa woreda is fundamental but the woreda does not receive enough rainfall. As the soil texture of Assosa woreda is sandy soil (AZDoPED, 2019), it has no capacity to hold moisture and thus soil moisture content is low thereby making the woreda unsuitable for subsistence food production As a result, planning and application of various policies to increase the livelihoods of rural people in Assosa and food security condition requests area specific information on the problems of food insecurity. The problem of food security takes particular forms in its dynamics and extent at different level of researchers' analysis at different areas. However, in the Assosa district, there are no such studies conducted on issues related to the issue. Besides, food insecurity related challenges, e.g., productivity reduction and increased dependence on food aid (safety-net) were increasing. In view of the biophysical, socioeconomic, and cultural peculiarities of the study area, investigating the causes, status, extent and dynamics of food insecurity is crucial. Furthermore, the study site is one of the drought prone districts with the majority of the kebeles supported by the Productive Safety Net Program (PSNP). Therefore, examining the extent and dynamics of food insecurity of the Assosa district is vital for generating information to be used by development agents, local

administration, researchers and other interested actors as information sources. To fill these gaps and contribute towards tackling food insecurity problems in the locality, updated information on food insecurity extents and dynamics are crucial. Consequently, this study was undertaken in Assosa district of Western Ethiopia to address the aforementioned problems by addressing the following objectives.

1.3. Objective of Study

1.3.1. General Objective

The general objective of the study is to examine the extent and dynamics of food insecurity by smallholder farmers in Assosa District of Western Ethiopia.

1.3.2. Specific Objectives

The following specific objectives were addressed in this study:

1. To examine the extent of food insecurity by small holder farmers.
2. To examine the dynamics of food insecurity by small holder farmers.

1.4. Research Questions

1. How is the extent of food insecurity of the smallholder farmers in Assosa woreda?
2. How is the dynamics of food insecurity of the smallholder farmers in Assosa woreda?

1.5. Significance of Study

A study on the extent and dynamics of food in security in Assosa woreda is essential because it contributes in providing information that will enable effective measures to be under taken so as to improve and bring successes in food security status in the woreda. Also the study will contribute in enhancing knowledge as to where and how to intervene in minimizing challenges related to food insecurity by the different stakeholders (governments, private, CBOs and non-government organizations). It will also contribute to scientific knowledge in the field area for use as reference and will identify gaps for/recommend for further studies.

2. Research Methodology

2.1. Description of the Study Area

Assosa district is found in the western part of Ethiopia, and is 663 km from Addis Ababa. Assosa is bordered on the north by Kurmuk Woreda, on the south by Mao Komo Special Woreda, on the west by Sudan and on the east by Bambasi Woreda. The administrative center of this woreda is Assosa. It consists 72 rural kebeles. Its altitude ranges from 580- to 1544m. a. s. l and its geographical land escape (agro-ecology) is divided into lowland and mid altitude with an annual rainfall of 850 to 1200mm. Agriculture is the pillar of the household economy, intensively carried out by those who have land and livestock. Crop production and animal husbandry are major activities. Agricultural products are consumed at home and partly sold to earn cash to meet other household needs, such as school fees, and contribute to social affairs such as Ekub, Edir, etc. Assosa district has total population of 92,687 among them 75,224 of households are under food insecurity according to data obtained from Assosa zone food Security-Disaster Preparation and Prevention office (2018).

2.2. Data Collection Methods

2.2.1. Sampling Producers/Technique

In this study a multi-stage sampling procedure was employed to select sample households from population. In the first stage, out of the 7 district of Assosa zone, Assosa district (which has 72 kebeles) are food in secured and made targets according to Assosa zone agriculture office and hence Assosa district was selected purposely. In the second stage, four Kebeles were selected purposively from the 72 kebeles of Assosa district specifically most food insecured kebeles based on their level of food insecurity (households that cannot feed their household members for ≥6 months during the previous year). These four sample Kebeles are selga 20, selga 22, selga 23 and selga 24. In the third stage, from these kebeles, 138 sample food insecured households were selected randomly based on probability proportional to the size of the households in these selected Kebeles.

2.2.2. Sample Size Determination Procedure

According to Hussey and Hussey (1997), no study can ever be supposed to be free from an error or provide 100% precision and error limits of less than 10% and confidence level of higher than 90% can be considered as acceptable. In this study, it is planned to take 8% level of precision in order to get the sample size which represents a true population. To determine the required sample size [13] was used. Hence, where n- sample size; N- total food insecured population of the four kebeles and e- level of error (8%) used. Following the formula out of 1216 households, 138 households were selected randomly for this survey.

$$n = \frac{1216}{1+1216(.08)^2}$$

$$n = \frac{1216}{1+1216(0.0064)}$$

$$n = \frac{1216}{1+7.7824}$$

$$n = \frac{1216}{8.7824} = 138$$

Table 1. *Number of sample households taken from sample kebeles.*

Name of the Kebeles	Total household size	Proportion	Sample size
Selga 20	280	0.23	32
Selga 22	250	0.21	29
Selga 23	306	0.25	34
Selga 24	380	0.31	43
Total	1216	1	138

2.2.3. Sources of Data Collection

For this study data from primary and secondary data

sources were used. The primary data were collected by using different data collection methods including household survey, focus group discussions, and key informant interviews. Whereas, the secondary data were obtained from reports of government institutions, Publications document, different websites and observations.

Household survey-The household survey was administered on 138 randomly selected households. Both open and closed ended questions were used for the household survey. The closed-ended questions were used for scoring and quantification of responses. The use of open-ended questions would allow respondents to have control over their responses rather than agreeing or disagreeing with questions posed by the researcher. Hence it would help respondents to freely express their views and opinions on the questions.

To enable high 'response rate' from the respondents, five data collectors were hired, trained in the administration of interviewing skills, collecting and conducting relevant, valid and reliable data-collection exercise. This has helped the researcher to address as many households as possible, use time and finance efficiently and allowed the researcher the space to record responses promptly.

Focus group discussions -The focus group discussions conducted with representatives of the community of four kebeles. They were conducted to draw opinion of those individuals who represent the community including women and male groups. It was done in order to triangulate points of view of participants. The Focus Group discussion helped to elicit qualitative data to supplement and complement both quantitative and qualitative information provided by the interview guides. The number of participants in each focus group ranged from 6 to 10 persons. For this discussion, an average of one hour session was used in each kebele. In each kebele two independent focus group discussions of elders and women groups were conducted.

Key informant interviews-A total of twelve key informant interviews were conducted to share their experiences and opinions about food insecurity situation of the people in the study area. These informants were experts and leaders of different offices including woreda agriculture and natural resource offices, elders, model farmers, women and kebele authority's representatives and Agricultural Development Agents. To collect the necessary data for the study, checklists, also referring to as standardized interview were used.

2.3. Method of Data Analysis

2.3.1. Food Consumption Score (FCS)

The Food consumption score (FCS) is a score calculated using the frequency of consumption of different food groups consumed by a household during the 7 days before the survey. There are standard weights for each of the food groups that comprise the food consumption score. To calculate the FCS from these results, the consumption frequencies are summed and multiplied by the standardized food group weight. As shown in the table 2 below households can then be further classified as having "poor," "borderline," or "acceptable" food consumption by applying the WFP's recommended cut-offs to the food consumption score.

2.3.2. Qualitative Data Analysis

Qualitative data analysis involves the identification, examination, and interpretation of patterns and themes in textual data and determines how these patterns and themes help answer the research questions at hand. The qualitative data (non- numerical and information) were incorporated into analysis which supports the numerical finding to establish a clear and credible links between the qualitative and quantitative information in the final analysis.

Table 2. *Food Consumption Groups and Cutoffs.*

Food Consumption Group	Food Consumption Score without Oil and Sugar	Food Consumption with Oil and Sugar
Poor Diet	0-21	0-28
Borderline Diet	21.5-35	28.5-42
Acceptance Diet	>35	>42
Source: WFP 2008		

3. Results and Discussion

3.1. Extent of Food Insecurity

Based on world food program to calculate the FCS results of food group, out of total respondents 81.16 percent of food insecurity household were poor food consumption groups. The other remaining 7.25 percent and 11.59 percent of food security households were borderline and acceptable food consumption group, respectively. This indicates that the extent of food insecurity of the households is high because most of households were found poor food consumption group.

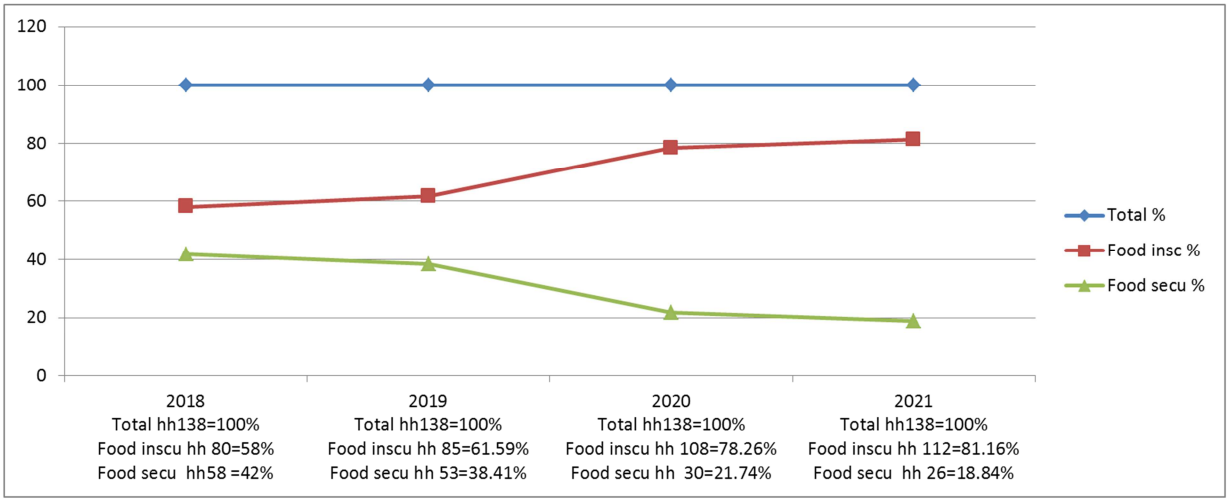
Table 3. *Distribution of sample households by extent of food insecurity.*

Extent	Food in secured HH		Food secured HH		Total HH	
	Frequency	Percent	Frequent	Percent	Frequent	Percent
Poor food consumption	112	100	0	0	112	81.16
Borderline consumption	0	0	10	38.46	10	7.25
Acceptance consumption	0	0	16	61.54	16	11.59
Total	112	100	26	100	138	100

Source: survey result

3.2. Dynamics of Food Insecurity

In the study area analysis of household food insecurity during the last recent four years shows that the situation of food insecurity varies over time. The result shows that in 2018 and 2019 food secure households declined from 42% to 38.41%, and food insecure households increased from 58% to 61.59%. The proportion in 2020 and 2021 of food secure households declined from 21.74% to 18.84%, and food insecure households increased from 78.26% to 81.16%. In year 2019, food secures households declined by 3.59% and food insecure households increased by 3.59% from past year. While in 2021, foods secure households declined by 2.9% and food insecure households increased by 2.9% from 2020. See the (Figure 1 below) shows the trend in food insecurity that shows increment from year to year due to decreasing fertility of soil, unstable seasonal rainfall and drought.



Source: survey result

Figure 1. *Dynamics in food insecurity.*

4. Conclusions and Recommendations

This study has analyzed the extent and dynamics of food insecurity in the rural farm households of the Assosa District of Western Ethiopia.

The findings show that the majority, 81.16% of the sampled households, were found to be food insecure during the period of the survey. The implication is that food insecurity continues to affect the communities in the study area, Assosa district. According to the food consumption score (FCS) of the world food program, out of total respondents 81.16 percent are categorized in poor food diet groups, while the remaining 7.25% and 11.59% are put under the borderline diet and acceptable diet groups, respectively.

On the other hand, the finding shows that analysis of household food insecurity during the last recent four years shows that the situation of food insecurity varies over time. In year 2019, food secures households declined by 3.59% and food insecure households increased by 3.59% from past year (2018). While in 2021, foods secure households declined by 2.9% and food insecure households increased by 2.9% from 2020. The findings show that the severity of the food insecurity is increasing over the last recent years. That is, the severity of food insecurity is increasing from year to year mainly due to unstable rainfall and continued climate change. The food insecurity situation of the study area is extremely difficult and alarming and needs an urgent response.

Food security issues at the Assosa district of West Ethiopia requires more in-depth and continued study outputs and proper use and implementation of the information gained as the area is found to be influenced by several, interlocked and site specific dynamics and extent that, of course, require immediate and coordinated attention from different actors.

Conflicts of Interest

Author declared no conflict of interest.

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