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Villagization as a Policy Option to Rural Food Security: Facts from Villages in Assosa Zone, Benishangul-Gumuz Region, Ethiopia

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ABSTRACT

Background: Villagization scheme was chosen as a policy option and implemented to ensure sustainable food security in Assosa zone, Benishangul-Gumuz region, Ethiopia, although it is blamed for intensifying food insecurity instead. Therefore, the present study aimed to examine the food security status of households gathered in planned villages in the framework of villagization. **Methods:** This cross-sectional study was conducted on 344 households who were randomly selected. A questionnaire was used after exploring the perception of village communities about the nature of food security. Food security status was measured using a household food balance model (FBM) that uses calorie threshold value of 2100 Kcal/Adult Equivalent (ADE)/day. **Results:** There were some basic services and infrastructures in the planned villages, although most of them were supplied before the implementation of villagization scheme. The scheme did not improve the food security status of households in the villages; since about 67% of them were food insecure and only 33% were food secure. The proportion of food insecure households is much more than the recent national figure of 40%. **Conclusion**: In spite of the fact that some basic services and infrastructures were supplied in the planned villages, villagization did not improve the food security status of households; in contrast food insecurity remained high. The scheme was merely supplied the service and infrastructures without improving economic access to basic services and infrastructures. It is recommended to conduct a study investigating why villagization could not improve the food security status according to the intended purpose.

Keywords: *Villagization; Infrastructure; Services; Food security*

Introduction

Food is the basic need for all living organisms to continue their life cycles (Roy *et al.*, 2019). People may eat food, but ensuring secure access to food is a serious challenge and a priority agenda of

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developing countries like Ethiopia. In this country, the mainstay of the economy is agriculture, which is technologically backward, as over 80% of the population relies on agriculture (Mohamed, 2017). As a result, poverty and food insecurity have threatened the country for a long time.

The proportion of poor and food insecure people was 55% of the total population of Ethiopia in 2000s (Belay, 2004). Since recently, this figure has declined to about 40% (World food programme, 2014) although the absolute number of food insecure and poor people remains high. The recent information have shown that about 41% of the population of Ethiopia lives in poverty and food insecurity challenges (Wondifraw *et al.*, 2016). Compared to the national figure of 55% in 2000s, more than 58% of the people in Benishangul-Gumuz region (BGR) lived in poverty (BGR-FEDB, 2004). In fact, BGR is generally characterized by seasonal food insecurity, although some parts of the region, such as Guba, Sher-Kole and Kurmuk districts face it for several months each year (BGR-FEDB, 2004). In these districts, food insecurity has already become chronic in nature. Studies at household level in some districts showed that the proportions of food insecure households in Assosa, Bullen, and Belo-jiganfoy were 85% (Amberbir, 2008), 58% (Daie, 2014) and 72% (Guyu and Muluneh, 2015), respectively. This shows that poverty and food insecurity have remained high in the region. The motive behind this study was that there is no research that examines the role of villagization in improving food security in Ethiopia so far.

Historically, villagization scheme has been adopted and implemented by different countries of mainly Africa. For example, countries like Tanzania, Rwanda, and Mozambique attempted the scheme. However, all of them failed to achieve the intended goal of modernizing their respective people, as is the case in Ethiopia (Van Leeuwen, 2001). Similarly, the government of Ethiopia adopted and implemented villagization scheme during the Derg regime; however it failed (Pankhurst, 1992). Despite this, the current government has repeated the same since 2010 (Daie, 2012).

Villagization has been implemented as a major strategy to ensure sustainable food security since 2003 in nomadic and semi-nomadic areas of the country. Accordingly, about 500,000 people in Somali region, 500,000 in Afar region, 225,000 in Benishangul-Gumuz, and 225,000 in Gambella were intended to be collected in planned villages (The Food Security Coordination Bureau (FSCB), 2004). It was implemented in almost all districts of BGR between 2010 and 2013 (Daie, 2012). However, no clear report shows the number of people that were actually collected in each region. In fact, it is difficult to accept that villagization has achieved its objectives of improving rural livelihoods in general and agricultural productivity and food security in particular, as can be indicated from some previous studies.

A previous study assessed the hidden agenda of villagization from rights perspective and concluded that villagization in Gambella region had implicit objective of land grabbing under the pretext of large scale land investment (Horne and Bader, 2012). Another study assessed the process of implementation of villagization in BGR and concluded that the scheme failed to achieve its objective at the very beginning (Daie, 2012). Another study also concluded that villagization scheme in Ethiopia are more political in nature but did not achieve the intended objectives of ensuring sustainable livelihood and food security (Amare, 2016). The present study attempted to narrow the gap in literature by measuring the food security status of households in the framework of villagization scheme in selected districts of Assosa zone.

This is the first study conducted to show the extent to which villagization achieved its objective of improving food security status of households collected in planned villages. Thus, it has both theoretical and practical significance to researchers and policymakers, respectively. With this general background, the present study aimed to examine the role of the villagization scheme in improving the food security status of households in Assosa zone. Accordingly, the following basic research questions

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were used to guide the study:

Has the villagization scheme improved the situation of basic services and infrastructure in planned villages? Is there a difference in the level of implementation of these programs 'before and after'?

Has the villagization scheme improved the food security status of villagized households? How did the community members perceive the role of villagization in improving the food security status of households? What was the actual level of food security after the implementation of the villagization scheme?

People are regarded as food secure 'when all people, at all times, have physical, social, and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life'. In contrast, food insecurity is a situation in which people have uncertain physical and economic access to safe, sufficient, and nutritious food to meet their dietary needs or food preferences for a productive, healthy, and active life (Food and Agricultural Organization, 2008).This definition applies at all levels of analysis, i.e. national, community, household or individual. At national level, it is related to physical existence of food stocks for consumption, both from its own production or from markets. Household food security is related to the ability to obtain sufficient food with sufficient quality to meet nutritional requirements of all household members. Household level food security mainly relies on household income and purchasing power of household members which is again related to income distribution in the household.

At any of these levels, analysis all pillars of food security namely availability, access, consumption/utilization, stability, and sovereignty should be addressed properly if food security is to be ensured (Food and Agricultural Organization, 2018). This requires appropriate food security policy and strategy, which is the focus of the present study. One of the strategies of ensuring sustainable food security in Ethiopia is villagization. Therefore, it is crucial to study the role of villagization scheme in improving food security.

Villagization is defined as "population grouping of into centralized planned settlements." It is an aspect of voluntary resettlement policy which, in Ethiopia, was found to be appropriate mainly for the four emerging regions of the country (The Food Security Coordination Bureau (FSCB), 2004). However, the basic notion of villagization is related to re-grouping into villages, which usually does not involve moving significant distances (Daie, 2012, Pankhurst, 1992). In principle, all the necessary services and infrastructures would be supplied in the planned villages. The process of the scheme implementation is criticized from a number of grounds (Amare, 2016, Buzuayew *et al.*, 2016). It is an appropriate time for measuring the food insecurity status of the village communities to see if villagization has achieved its goals.

The high level of national and regional poverty and food insecurity is directly related to ineffectiveness of the rural development policies and strategies in general and the food security policy of the country. In Ethiopia, the government has designed and implemented Agricultural-development-led-industrialization (ADLI) strategy for the last two and half decades. ADLI was intended to develop the agricultural sector and then accelerate the growth of national economy and improve food security. To this end, different programs were designed and implemented, such as the national food security program (NFSP). The NFSP has four major components, including productive safety net program (PSNP), household asset building program (HABP), complementary community investment program (CCIP) and voluntary resettlement program (Amare, 2016), which villagization is found to be appropriate mainly for the four emerging regions of the country namely Afar, Somali, Gambella, and Benishangul-gumuz (The Food Security Coordination Bureau (FSCB), 2004).

Materials and Methods

The study area: BGR is one of the nine administrative regions of Ethiopia located in northwestern part of the country although its southern part, including Assosa zone, is close to its

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western tip. Assosa zone is one of the three administrative zones of BGR and consists of eight districts namely Assosa, Bambasi, Homosha, Menge, Sher-Kole, Kurmuk, OdaBilgdilu, and Mao-Komo. The food security situation of the sample households selected from Assosa, Bambasi, Homosha, and Menge was studied. Assosa town, 586 km from Addis Ababa (the capital city of Ethiopia), serves as regional capital. Astronomically, the town is located at 42^0 30'E and 9^0 26'N.

BGR receives adequate rainfall despite its variability. The rains are characterized by unimodal type that usually start in April and end in December each year. Its mean annual temperature is 28 ^{0}C. The mean annual rainfall is 1200 mm, which vary between 800 and 2000 mm. Most districts of Assosa zone are relatively fertile and have high agricultural potential. The main types of crops produced in the zone are sorghum, maize and haricot bean, soya bean, sweet potato, onion, mango, and other fruits and vegetables. The main cash crops of the zone are sesame, 'nug', red pepper, fruits, and vegetables.

Measurements: This *c*ross-sectional survey was conducted to collect data in February and March 2019. Exploratory assessment was conducted in February by conducting key informant interviews. The purpose was to understand the perception of village community members (households) and official regarding whether or not villagization scheme have improved the food security. In March, cross-sectional survey was conducted using questionnaire. The validity and reliability of the questionnaire were tested via test re-test method. The survey was conducted with 344 respondents who were randomly selected from four districts of Assosa zone namely Assosa, Bambasi, Homosha, and Menge. Physically accessible villages from these districts were selected for the study. This was the main source of data used for measuring the food security status of households living in the planned villages.

Data analysis: Information obtained from Key Informants (KIIs) is used merely for exploring the view of the informants about the role of villagization scheme in improving food security. The perception of the informants was quantified and presented in terms of percentage. The food security status was determined as a function of the amount of calories obtained from all available sources of food to a household, including own produced food, purchased food from market, and borrowing from others. The net amount of calories obtained from food balance model (FBM) of all sources was compared with the threshold value of 2100 kcal/Adult Equivalent (ADE)/day recommended by FAO. The net available food (NAF) to each household was therefore calculated using the FBM as follows.

NAF = (OPF + PF + BF) – (FSLD + SR+ PHL)

Where; NAF = Net available food for a household for the year under consideration

OPF = Own produced food by the households

PF = Purchased food from market

BF = Food borrowed by a household during the year under consideration

FSLD = Food sold during the year

SR = Seed reserved from own production during the year (estimated as reported by respondents)

PHL = Post harvest loss due to various reasons, such as rodents, etc. (5% of total food)

Results

Characteristics of respondents: The study was conducted based on the 344 sample households and 23 key informants selected from 8 villages which were in turn selected from 4 'woredas' of Assosa zone. The total family size of the sample household was 2301 (i.e. 1785.88 in ADE) with mean household size of 6.68, which is 5.19 in ADE. The male and female respondents constituted 89.8% and 10.2%, respectively. The mean age of the respondents was about 45 years with minimum and maximum age of 27 and 68, respectively. According to the information obtained from all districts, each household in the planned villages were given 3ha of farmland. Those who had more than this amount were allowed to own up to 10 ha. However, the study showed that the mean land size possessed by the respondents was about 3.24 ha with minimum and maximum of 0 ha and 7 ha, respectively.

Situation of basic services and infrastructure:

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The main intent of villagization scheme was to supply basic services and infrastructure that would improve village communities' access to food and ensure sustainable food security. Therefore, this subsection presents the results of the study on the situation of socioeconomic services and infrastructure 'before' and 'after' the implementation of villagization scheme. In this study, socioeconomic services and infrastructures include schools, health posts, health extension services, veterinary clinics, rural road, and transports. Income generating activities, such as petty trade, access to credit and saving, markets, and supply of agricultural input were in place prior to the implementation of villagization.

The results of field observation and KIIs during exploratory assessment revealed that some of the infrastructures were supplied prior to villagization in some villages and in others after it. The access to, and conditions of, socioeconomic services 'before' compared to 'after' the implementation of villagization was debatable. All of the key informants interviewed at all administrative levels stated better condition of infrastructures 'after' than 'before' the implementation of villagization. In contrast, almost all key informants selected among village community members did not agree that villagization had improved the level of infrastructure in their respective villages. Regardless of the time of establishment, researchers' field observations proved the presence of some physical infrastructures in almost all villages.

Major sources of food and its amount: Three sources of food were reported during the questionnaire survey, including own crop production, purchasing from markets, and borrowing from neighbors. Crop production included the production of different types of cereals, legumes, oil seeds, fruits, and vegetables. Maize and sorghum were cereals reported major sources of food in the study area. The major legumes include haricot bean, soya been, and 'apo' and the major oilseeds include sesame and 'nug'. The major fruits include mango, papaya, and oranges, although others such as lemon are rarely produced. Vegetables, such as tomatoes, onion, garlic, potatoes, kale, cabbage, and pumpkin were largely produced. It was, however, difficult to quantify the amount of most of the fruits and vegetables, such as papaya, lemon, kale, and pumpkin. The researchers attempted to quantify them based on the estimates reported by the farmers. Purchasing from markets and borrowing were also reported sources of food for the respondents (**Table 1**).

The study shows that the surveyed households as a whole produced 10,342.5 quintals of cereal grain during the survey year with mean and standard deviation of 30.1quintals and 21.2 quintals, respectively. This is about 86.4% of total own production, indicating that legumes with 1621 quintals, oilseeds, and vegetables altogether constituted only about 13.6% of own crop production. Purchasing and borrowing constituted a very small portion of food accessed by the respondents. Both together were source of 386.50 quintals food forming only 3.1% of the total food accessed by the respondents from all sources. The respondents had access to 12350.00 quintals gross amount of food during the survey year. This resulted in the per capita crop yield of 6.69 quintal/ADE/year (i.e. dividing 12350.00 quintals by 1785.88ADE) before undertaking all the necessary deductions (**Table 1**).

The net available food for all respondents after deductions of sold grains, reserved seeds, and postharvest losses (i.e. 5% total food produced) was 6144.82 quintals. This is about 49.9% of the total food available to all the respondents, which was used to calculate the per capita NAF. Accordingly, the mean per capita NAF to the respondents was 3.44 quintals/ADE/year with standard deviation of 2.78 quintals before converting to equivalent calories.

Food security status perceived by the community: Information obtained from exploratory study based on the key informants showed that villagization could not improve the food security situation of village communities. However, the informants selected among officials at different levels concluded that the program improved the living conditions of village communities. In contrast,

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those selected from planned villages reported that villagization could not ensure their food security situation. They said that food security situation of most community members was better 'before' than 'after' the implementation of villagization. Concerning this, the study also attempted to examine the questionnaire respondents' perception. The majority (i.e. 84%) of the respondents reported that villagization did not significantly improve their food security and livelihood condition. Considering food security alone, 90% of them told that food security was better met before the implementation of villagization in their respective villages. This result is in line with the food security status measured based on the amount of calories.

Calorie-based measure of food security: Calculation of the net available food after the necessary deduction was 3.44quintal/ADE/year. This shows that on average the village communities were food secure, according to FAO's recommended threshold of 1.89 quintals/ADE/year. Cereal equivalent measurement of food security is criticized for its inappropriateness as it shows the variations in the amount of calories in different types of food. Accordingly, the NAF for all the respondents was converted to kilocalories (kcal) based on the conversion factors given by the Ethiopian Health and Nutrition Research Institute (EHNRI, 1998). The net calorie available to the respondents was assumed to be consumed and compared with calorie threshold value of 2100kcal/ADE/year to determine the proportion of food secure and food insecure households (**Table 2**).

The results show that about 67% of households were food insecure and only 33% were food secure. Both types of respondents had access to a total of 5876970.50 kcal during the survey year. The amount of calories available to food secure and food insecure households was 2627010.10 kcal and 3249960.30 kcal, respectively. The largest mean deviation in Kcal/ADE/day was (SD = 1325.5) for food secure compared to the food insecure (SD = 841.0) households. This implies that there was higher variability among the food secure than food insecure households in terms of the mean amount of available calories.

Table 1. Source and amount of food available to the respondents.

Food source	Amount produced (in quintal) and household size (Adult equivalent)				
	Total	%	Mean ± SD	Min.	Max.
Cereals	10342.50	83.80	30.07 ± 21.21	0.00	97.00
Legumes	523.50	4.20	1.52 ± 8.10	0.00	19.00
Oil seeds	733.00	5.90	2.13 ± 7.13	0.00	32.50
Vegetables	364.50	3.00	1.06 ± 1.23	0.00	11.00
Total produced	**11963.50**	**96.90**	**34.78 ± 22.25**	**0.00**	**97.00**
Grain purchased	289.00	2.30	0.84 ± 2.13	0.00	3.00
Grain borrowed	97.50	0.80	0.28 ± 0.15	0.00	1.50
Grand Total	**12350.00**	**100.0**	**35.90**	-	-
Grain sold	5204.50	42.10	15.30 ± 6.50	0.00	26.50
Seed reserve	402.50	3.20	1.17 ± 1.11	0.00	9.50
Grain lost	598.18	4.80	1.56 ± 0.24	0.013	4.20
Total deduced	**6205.18**	**50.10**	**13**.04 ± 5.20	**0.00**	**63.25**
Net available food	**6144.82**	**49.90**	**17.86 ± 10.20**	**0.01**	**42.50**
Household size (number)	**2301**	-	**6.68** ± 1.53	**1.0**	**13**
Household size (Adult equivalent)	1785.88	-	5.19 ± 2.13	1.25	10.18

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Table 2. Distribution of households by kcal supply and food security status.

Information	Description and Parameters		
	Description	Total	Mean ± SD
Household size	Number	2301	6.68 ± 1.53
Household size	Adult eqivalent	1785.88	5.19 ± 2.13
Kcal	Food secure + Food insecure	5876970.5	1867.3 ± 1253.2
Food Secure households	Ave. adult equivalent	492.55	1.32 ± 2.22
	Kcal/adult equivalent/day	2627010.1	3333.15 ± 1325.5
Food insecure households	Ave. adult equivalent	1293.33	5.67 ± 1.25
	Kcal/ adult equivalent/day	3249960.3	1120.02 ± 841.0

Discussion

It was found that some basic services and infrastructures expected to improve the livelihood and food security situation of village communities 'before' and 'after' the implementation of villagization scheme. The findings showed that there was no significant difference between 'before' and 'after' the implementation of the scheme. This is in line with a study conducted in Afar region, Ethiopia (Buzuayew *et al.*, 2016). However, several basic physical infrastructures and services were observed provided by the government. Most of the infrastructures and services were in place before the implementation of the scheme. This indicates that the government did not consider the economic capacity of the village communities to access the services like agricultural inputs. This is consistent with a study which found that villagization scheme in BGR failed to achieve its objectives at the very beginning of its implementation (Daie, 2012). This is also similar with the findings a study on Human Rights Watch (HRW) in Gambella region reporting that villagization in Ethiopia has implicit aim of grabbing land under the pretext to large scale land investment (Horne and Bader, 2012). In summary, some basic infrastructures and services were found in the planned villages, but the village community members were likely economically unable to access most of them.

We also found strong evidence that villagization did not improve the food security status of communities in the planned villages. The results of the present study showed that about 67% of the surveyed households in the planned villages were food insecure and only about 33% were food secure. This goes against the basic intent of villagization; improving food security status of rural communities by gathering them onto nucleated villages and supplying them with basic services and infrastructures (The Food Security Coordination Bureau (FSCB), 2004). This result is in line with the findings of most food security studies in the region, indicating a high level of household food insecurity (Amare, 2016, Amberbir, 2008, BGR-FEDB, 2004, Daie, 2014, Guyu and Muluneh, 2015).The present food insecurity level is far more than in 2000s at national (Belay, 2004) and regional levels (BGR-FEDB, 2004).Therefore, food insecurity persisted in the planned villages, despite the government efforts to supply some basic infrastructures and services in Assosa zone.

Conclusion

The perception of the community members was explored about the role of villagization scheme in ensuring food security. After concluding that the scheme did not improve food security to the desired level, food security status was further measured at household level in the planned villages using calorie approach. Based on the findings, it was concluded that villagization scheme did not improve the food security situation of the households in the planned villages. Despite the fact that there were some improvements in socioeconomic infrastructures and supply of basic services, villagization did not significantly improve the food security status of households to the desired level. This might be due to the fact that the scheme did not improve communities' economic access to the

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infrastructures and services. Therefore, villagization in BGR in general and in Assosa zone in particular has achieved less of its objectives, including reducing poverty and, improving food security.

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Authors' contributions

Guyu F conceived the research idea, designed the study, reviewed the literature, organized the information, drafted the paper, and edited the manuscript for the first time. Tadele T together with Guyu F conducted exploratory study. Both authors read, reviewed, and approved the final manuscript.

Conflict of interests

The authors declare that there is no conflict of interests.

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