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Literature Review on Farmers' Access to Agricultural Credit in Ethiopia

Etiyopya'da Çiftçilerin Tarım Kredilerine Erişimi Üzerine Literatür İncelemesi

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LITERATURE REVIEW ON FARMERS' ACCESS TO AGRICULTURAL CREDIT IN ETHIOPIA

ABSTRACT:

Agriculture is one of the important sectors that contribute to the economy of a country. It contributes the largest portion of the Ethiopian Gross Domestic Product, followed by the industry and service sectors, respectively. Farmers' access to credit is essential to increase agricultural productivity and modernize agriculture. The purpose of this study was to review the recent literature related to the access to credit of farmers in Ethiopia. The reviewed literatures were obtained from Google Scholar, Science Direct, Web of Science, FAO, and World Bank. According to reviewed literature, the variables of age, gender, education level, family size, land size, number of livestock owned, years of membership to a lending institution, distance from the credit center, and income level of farmers were determined as affecting factors for farmers' access to credit. The impact of access to credit on farm productivity was found to be positive and significant. The literature revealed that most of the farmers were credit constrained and had loan demand. If the constraints were removed and farmers could access enough credit, agricultural productivity would be increased and agricultural income would be improved. Therefore, the government has to support microfinance institutions in order to provide credit to farmers, and women empowerment should be ensured for fair credit access.

Keywords: *Determinants, Access to Agricultural Credit, Literature Review, Ethiopia.*

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ETİYOPYA'DA ÇİFTÇİLERIN TARIM KREDİLERİNE ERİŞİMİ ÜZERİNE LİTERATÜR İNCELEMESİ

ÖZ:

Tarım, ülke ekonomilerine katkı sağlayan önemli sektörlerden biridir. Etiyopya'da Gayri Safi Yurtiçi Hasıla'nın en büyük kısmını tarım oluşturmaktayken, onu sırasıyla sanayi ve hizmet sektörleri izlemektedir. Tarımsal verimliliği artırmak ve tarımı modernleştirmek için çiftçilerin krediye erişimi büyük önem taşımaktadır. Bu çalışmanın amacı, Etiyopya'da çiftçilerin krediye erişimiyle ilgili güncel literatürün gözden geçirilmesidir. İncelenen literatür Google Scholar, Science Direct, Web of Science, FAO ve Dünya Bankası'ndan elde edilmiştir. İncelenen literatüre göre yaş, cinsiyet, eğitim düzeyi, aile büyüklüğü, arazi büyüklüğü, hayvan sayısı, örgütlerine üyelik süresi, kredi merkezine uzaklık ve çiftçilerin gelir düzeyi değişkenleri, çiftçilerin kredi erişimini etkileyen faktörler olarak belirlenmiştir. Krediye erişimin

tarımsal verimliliği üzerindeki etkisi olumlu ve anlamlı bulunmuştur. Literatüre göre çiftçilerin büyük bir kısmının kredi kısıtlılığı ile birlikte kredi talebi bulunmaktadır. Kısıtlamalar kaldırılırsa ve çiftçiler yeterli krediye erişebilirse, tarımsal verimlilik artacak ve bunun sonucunda tarımsal gayri safi yurtiçi hasıla iyileşecektir. Bu nedenle, hükümet çiftçilere kredi sağlamak için mikrofinans kuruluşlarını desteklemeli ve adil kredi erişimi için kadınların desteklenmesi gerekmektedir.

Anahtar Kelimeler: *Etiyopya, Etkili faktörler, Literatür Taraması, Tarım Kredisine Erişim.*

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1. INTRODUCTION

Agriculture is one of the most important economic sectors that play vital role in ensuring internal food security, employment growth, and poverty reduction (Soubbotina & Sheram, 2000). Agriculture has been considered as a crucial economic sector in both rural and urban areas (E. Saqib et al., 2018). In addition, agricultural production still accounts for a large proportion and contribute to the employment of most workers. Also, the agricultural sector has strategic importance in terms of producing nutrients, supplying raw materials to the industry, and providing foreign exchange through exports (Başer & Bozoğlu, 2018). Therefore, it is important to support farmers in order to increase agricultural production. One of the fundamental tools that are used to support farmers is providing access to agricultural credit. However, farmers in rural areas of developing countries still find it difficult to obtain credit to increase their production (Yadav & Sharma, 2015). Difficulties in raising funds in rural areas resulted in a decline in production, gross domestic production (GDP), and the national food security of poor countries (Guirkinger & Boucher, 2008). Therefore, access to agricultural credit is considered as an important factor in economic development, especially for low-income farmers (Ellis, 2000).

Based on the United Nations Population Division's World Urbanization Prospects as 2019, about 79% of the Ethiopian population lived in rural areas and was mainly operating farm to generate income and food (World Bank, 2018). Since most of the population have lived in rural areas, the government has been targeting the agricultural sector to improve national income. The vision of the Growth and Transformation Plan II (GTP II) is to become a lower middle-income country by 2025. This plan mainly targets improving the agricultural sector to speed up its contribution to national income. The Economic Development Sector section of GTP II deals, inter alia, with agricultural and rural transformation. In particular, bringing a significant shift in agricultural productivity, building productive capacity, and thereby enhancing the sector's contribution to the economy and stabilizing the macroeconomy are the objectives of this plan (FAO, 2016).

Providing credit for farmers is one of the tools used to build the productive capacity of farmers so that they can efficiently produce and contribute to the economy of the country. Removing farmers' credit constraints and allowing them to get access to enough credit are substantial. The value of output per acre of constrained farmers would be increased by 60%, relative to their current productivity level, if all types of credit constraints could be alleviated (Mukasa et al., 2017). This implies that providing enough access to credit for farmers to build their productive capacity is one of the main instruments to transform the country from a low-income country to a lower middle-income country.

Lack of agricultural credit is one of the major problems that smallholder farmers are facing (Admassie, 2004). Farmers require financial resources to purchase improved agricultural inputs and farm implements in order to increase output and income and break the cycle of poverty. Investments of farmers in these technologies cannot be realized unless organizations and systems capable of providing adequate rural financial services to farmers are in place. As a result, efforts to develop agriculture may suffer in the absence of a strong financial foundation to increase access to credit for smallholder farmers.

1.1. Objectives of the Study

This study aims to review access to agricultural credit of farmers in Ethiopia by systematically arranging published and unpublished research. In particular, this review analyzes the previous literature from a descriptive perspective and summarizes and compares determinants of access to agricultural credit in Ethiopia. This study can help future researchers and policymakers by introducing several interrelated aspects related to agricultural credit in one place. Researches on the characteristics of agricultural credit, the determinants of access to agricultural credit, the impact of agricultural credit access on productivity and output, and some related issues are discussed and summarized. In particular, this paper can help policymakers/banks/lending institutions in Ethiopia to understand and take action on current issues related to the status and performance of agricultural credit. This article also puts forward the future prospects of this Ethiopian agricultural credit market research.

Most of the researches that were conducted in Ethiopia were kept in different libraries within the country rather than being published on different journals. Therefore, many researches may not be accessed using a search engine on the internet. However, the research and journals related to agricultural credit issues and accessed through Google Scholar, Science Direct and Web of Science were collected and critically reviewed to describe agricultural credit access in Ethiopia and identify factors affecting access of farmers to credit and the impact of credit on agricultural productivity.

2. MATERIAL AND METHODS

Google Scholar, Science Direct, and Web of Science were used to search for relevant and recent literature on access to agricultural credit of farmers in Ethiopia. In addition, the most reliable data collectors like FAO and World Bank were used as source of data to analyze current statistics related to the agricultural credit market in Ethiopia. The related literature collected from these sources for review were about 39, and 10 of them were selected for critical review. The collected literature was discussed to provide insights about farmers' access to credit in Ethiopia.

Admassie (2004) reported the agricultural finance performance in Ethiopia by categorizing the time period as Imperial period (before 1974), Derg period (1974-1987), and Post-reform period (after 1987). The history of formal financial sector development started when the Imperial Charter established the State Bank of Ethiopia in 1942. During that time, smallholder farmers only received about 7.5% of the total agricultural finance. After Post-reform, the percentage of farmers who had access to credit increased to 33.3% (Mukasa et al., 2017). Waje (2020) reported that only 36.54% of farmers had access to agricultural credit in 2019.

Table 1 introduced the summary of the title, study area, model and publisher of critically reviewed researches. Most of researchers tried to approach the farmers' access to credit and impact of credit on farm productivity through probit and logistic regressions. The detailed outputs of their model were discussed in section 3.

Table 1: The summary of most critically reviewed literatures

Authors and Year	Title	Study area	Method	Publisher
Abate et al. (2016)	Rural Finance and Agricultural Technology Adoption in Ethiopia: Does the Institutional Design of Lending Organizations Matter?	Ethiopia	Probit model (nonparametric kernel- based matching, five-nearest-neighbors matching, and radius matching.)	World Development
Gebeyehu et al. (2019)	Impact of Agricultural Credit on Maize Productivity among Smallholder Farmers	Oromia	Probit Regression Model	Ethiopian Journal of Applied Science and Technology
Gebeyehu et al. (2019)	Determinants of Access to Agricultural Credit among Small holder Maize Farmers	Oromia	Probit Regression Model	International journal of Horticulture, Agriculture and Food science
Waje (2020)	Determinants of Access to Formal Credit in Rural Areas of Ethiopia	Southern Nation, Nationalities and Peoples Region	Probit Regression Model	Economics
Argaw (2017)	Analysis of Determinants of Access to Credit among Smallholder Farmers	Southern Nation, Nationalities and Peoples Region	Logistic Regression Model	Journal of Economics and Sustainable Development

Tesfaye et al. (2019)	Determinants of Access to Credit Among Small Scale Irrigation User Farmers	Amhara	Logistic Regression Model	Journal of Economics and Sustainable Development
Amanuel & Degye (2018)	Determinants of microfinance loan utilization by smallholder farmers	Southern Nation, Nationalities and Peoples Region	Independent Double-Hurdle Model	Journal of Development and Agricultural Economics
Mulatu et al. (2020)	Smallholder Farmers' Credit Participation	Southern Nation, Nationalities and Peoples Region	Independent Double-Hurdle Model	Journal of Agricultural Economics and Rural Development
Mukasa et al. (2017)	Credit constraints and farm productivity	Ethiopia	Endogenous Regime Switching Regression Model	African Development Bank
Admassie (2004)	A Review of the Performance of Agricultural Finance in Ethiopia: Pre- and Post-Reform Periods	Ethiopia	Descriptive Analysis	International Conference on 'The Agrarian Constraint and Poverty Reduction.

3. RESULTS AND DISCUSSION

3.1. The Concept of Agricultural Credit

Various scientific papers introduced different definitions for agricultural credit. Singh Yadav (2017) defined credit as "*the ability to command other people's capital in exchange for a promise to repay at a later date*". Therefore, credit is comprised of two components: "ability to borrow" and "willingness to borrow". In other words, obtaining power over the use of money in the present in return for a pledge to repay it at a later date is referred to as credit. It can also be considered as an economic good to be produced, managed and marketed. Thus, credit involves a temporary transfer of wealth. Credit to farmers can be categorized into cash credit (loans given to farmers by financial institutions), and non-cash credit, which comprises the supply of inputs to farmers by companies, individual businessmen, etc., for which these farmers make payments after harvesting (Kuwornu, 2013).

Agricultural credit, according to Nwaru (2004), is "*the present and temporary transfer of purchasing power from one who owns it to another who wants it, allowing the latter to command another person's capital for agricultural purposes while remaining confident in his willingness and ability to repay at a specified future date*". In other words, it is the monetization of promises and the exchange of cash in the present for a promise to repay with or without interest in the future. If there is no willingness and ability to repay, the promise to repay at a future date would be pointless. It can also be defined as one of several vehicles used to finance agricultural transactions. Loans, notes, bills of exchange, and acceptances of banker are examples of these instruments. This type of financing is tailored to the specific financial needs of farmers, allowing them to secure equipment, plant, harvest, market, and do other things necessary to keep their farms running.

Agricultural credit has been an essential component of modernization and commercialization of agriculture and the rural economy (Abedullah et al., 2009). The introduction of easy and low-cost credit is the quickest way to increase agricultural output. As a result, meeting the credit needs of the farming community has been a top priority for all governments. Agriculture is more reliant on credit than any other economy sector due to seasonal variations in farmer returns and a changing market (Vogt, 1978). Therefore, credit is the important element that has to be considered as the main input for agricultural improvement.

3.2. Agricultural Credit Use

During the Imperial regime (1960s–1974), roughly half of all domestic credit for agriculture was distributed through two intermediary institutions such as the Grain Corporation and Farmers' Cooperatives (Abate et al., 2016; EEA, 2000). These intermediaries received credit funds from state-owned banks and extended low-interest loans to farmers. However, as with most of the directed credit programs implemented elsewhere during the same period, efforts to extend agricultural credit to small farmers were unsuccessful (Abate et al., 2016). Agriculture received between 42 and 65% of total domestic loans during this time, with smallholder farmers receiving only about 7.5%. The majority of agricultural credits went to large and influential farmers (Admassie, 1987, 2004).

Despite the fact that the socialist regime (1974–1991) continued the tradition of assigning specialized financial institutions, smallholder farmers did not fare any better during this time. They were denied credit because larger state-run farms were given priority (Abate et al., 2016). For example, during the regime's period of 1974–1984, approximately 89% of agricultural credits were channeled to state farms, while private smallholder farmers received only 11% (EEA, 2000). Furthermore, near the end of the socialist era, the depletion of capital faced by some of these lending institutions resulted in the abolition of the negligible credit shares to smallholder farmers (Ahma et al., 2010).

The post-reform period, which began with the Structural Adjustment Program to correct all types of financial distortions, did not fare any better. The total share of agricultural credit shrank significantly in the years following the economic reform (Abate et al., 2016). It was estimated that there was about a $3 billion credit shortage in the overall economic system (Amha & Peck, 2019). Furthermore, it appears that smallholder agriculture is suffering more than other sectors of the economy from the financial crisis. However, while agriculture contributed approximately 41% of total GDP in 2010/2011, the sector's share of total lending was only about 14 %. As a result, over the last two decades, the average credit–to–aggregate value of total agricultural production has been only 6% (Abate et al., 2016).

According to Getahun (2001), the source of agricultural credit in Ethiopia mainly categorized under two main categories. These are informal and formal financial sectors such as Commercial Bank of Ethiopia, and Agricultural and Industrial Development Bank. It is estimated that approximately 1% of all farmers use institutional credit. The huge percentage of agricultural loans emanate from non-institutional sources of agricultural loans such as private money lenders, other farmers, middlemen, neighbors, friends, relatives, and merchants. However, over the decades, the percentage of farmers who have access to credit has increased to 33.3 percent, with 66.6 percent of those who were credit constrained owing to risk concerns and transaction costs(Mukasa et al., 2017). Furthermore, the percentage of farmers who have credit access increased to 36.54% (Waje, 2020). Despite the improvement in credit access, it is obvious that there is still no enough credit access as expected.

3.3. Determinants of Agricultural Credit Access

According to the literature, level demographic, socioeconomic, and institutional variables of farmers influence the access to credit. Age, gender, family size, number of livestock owned by the farmer, distance of credit institution from farmer house, educational attainment of the farmer, and family size and income level are commonly regarded as factors influencing agricultural credit access in Ethiopia.

Table 2: Factors influencing farmers' credit access

Dependent Variable(s) (Credit access or use)	Waje (2020)	Gebeyehu et al. (2019)	Argaw (2017)	Tesfaye et al. (2019)	Mulatu et al. (2020)
Independent Variables					
Age	0.082*	-0.0174*	-0.123***	-0 .1091***	-0.012
Gender	0.398	0.6845**	0.798	0.40903	0.681*
Marital Status	0.129	-0.7307	0.304		
Education	0.000***	-0749**	0.133*		0.101**
Family size	0.953		0.464*		0.187**
Land size	0.417	0.889	1.27*		0.251**
Income level	0.725		1.11*	-0.00172	
Membership to credit institution	0.027**	0.0936***			
Collateral	0.001***	0.00034			
Saving Culture	0.000***			0.0026	
Livelihood diversification	0.000***	0.1535***			
Connection to lenders	0.000***				
Distance from credit source		-0.2237***	0.105	-0.4203	-0.054**
Livestock owned				0 .25516***	0.109
Experience of credit use	0.072*				
Extension service	0.000***	0.3121***	0.015		0.038**
Interest to credit (borrowing)					
Availability of social network			0.309		
Dependency ratio			-0.199		
Attitude towards risk			0.521		
Lending procedures				-3.0905*	
Repayment period				-3.4194*	
Perception loan provision time					1.348***
Perception on group lending					0.769**

Note; ***, ** and * is significant at 1%, 5% and 10% level, respectively

3.3.1. Age

Gebeyehu et al. (2019) used the probit model to conduct research in Horro Guduru Wollega Zone of Oromia and revealed that the age of farmers was negatively and significantly associated with the probability of accessing credit at a 10% significance level. According to the marginal effect, an increase in the age of a farmer by one year reduced the probability of farmer's access to credit by 0.69%. Therefore, older farmers had a larger capital base and were less likely to seek credit. Gebeyehu et al. (2019) result was in line with the findings of Mpuga (2004) who found that younger farmers were more likely to borrow because their investments were more active, energetic, and aggressive. Argaw (2017) also revealed that credit users and non-user farmers had an average age of 44.9 and 49.2 years, respectively. The difference in the age of the farmer among the groups was significant at the 1% probability level. In addition, (Waje, 2020) supported the negative relationship between the age of the farmer and credit access. Older farmers were less likely to get credit because older smallholder farmers were not expected to repay the credit they borrowed. According to the probit regression marginal effect estimation, the probability of accessing credit has decreased by 1.1% every year as farmers are getting older. On the other hand, age was an insignificant variable in the output of the ordered logit model used by Nouman et al. (2013) and the probit model used by Mulatu et al. (2020). The literature showed that the age of a farmer could be a significant variable and negatively affect the access to credit of farmers, and while others found that age of a household was an insignificant variable.

3.3.2. Gender

Mulatu et al. (2020) found that gender had positive and significant relationship with access to credit at 5% level of significance. The probit model output revealed that changing a dummy from female to male farmer increased the probability of credit access by 18.6% assuming all other variables remain constant. This research was consistent with Ayele & Goshu (2018) as they also found gender of farmer as a significantly influencing factor, namely, keeping other things constant, being a male farmer increased the loan size by 6% at a 10% of significance level. According to Gebeyehu et al. (2019), male-managed farms increased the probability of accessing credit from formal sources by 24.89% compared to female-managed farms. In addition, Awunyo-Vitor & Abankwah (2012) show that men were more likely than women to obtain credit. The number of credit users in female-managed farms was lower than the number of credit users in male-managed farms and was significant at 1% probability level (Argaw, 2017). The implication shows that women had few assets, small landholdings, and low productivity limiting their access to credit.

3.3.3. Education

According to the probit regression model result of Waje (2020), education had a positive and significant influence on the farmers' access to the credit process at a less than 1% probability level. The findings have showed that smallholder farmers who received formal education were more likely to have access to credit than those who did not. This result was consistent with Argaw (2017) who found that a one-unit increase in the farmer's education level resulted in a 0.033 increase in the farmer's likelihood of obtaining credit from microfinance institutions (MFIs). There was a positive relationship between the education level of farmers and the probability of accessing to credit (Amanuel & Degye, 2018; Asante-Addo et al., 2013; E. Saqib et al., 2018; Mohamed, 2003; Mulatu et al., 2020). In contrast, Gebeyehu et al. (2019) found that educational level had a negative and statistically significant (at 5%) relationship with the probability of farmers accessing to credit. Similarly, Nouman & Syed (2013) and Muhammed (2013) also found a negative relationship between the education level of farmers and the probability of accessing to credit. The reason for these findings was that a large proportion of agricultural credit interventions, such as MFIs, were aimed at poor farmers, and an educated individual could join to run their own business and earn income.

3.3.4. Family Size

According to E. Saqib et al. (2018)'s finding, a one-member increase in family size increased access to credit for a farmer by 0.059 units. Argaw (2017) revealed that household size influenced farmers' access to credit in a positive and significant way at a 10% probability level. The logit model result showed that a one unit increase in family members generated a 0.116% increase in the likelihood of credit access of farmer. These results were consistent with Mulatu et al. (2020) who found that the amount of loan earned by a household increased by 301.30 birr for every additional family member. The reviewed literature showed that the increase in family size had a significant and positive relationship with farmers' credit access.

3.3.5. Land Size of Farm

The results of E. Saqib et al. (2018) showed that the total landholding of the farmer was a significant factor in access to credit of the farmer, implying one acre increases credit availability by 0.216 units. Similarly, Nouman & Syed (2013) found a positive relationship between the total land holding of farmers and access to credit. Argaw (2017) found that one unit increase in the cultivated land holding of the farms produced a 0.318% increase in the probability of credit access for the household. Ayele & Goshu (2018) found the size of landholding as a significant determinant factor for microfinance loan utilization of farmers. According to these findings keeping everything else constant, as the size of the landholding

increased by 1 hectare, the likelihood of using a microfinance loan increased by 36.1%. Furthermore, Mulatu et al. (2020) supported the positive coefficient of the landholding size of the farmer when regressed as an independent variable to determine its effect on credit access probability. However, Gebeyehu et al. (2019) and Waje (2020) revealed that farmers' landholding size was not a significant factor to influencing agricultural credit access by using the probit regression model.

3.3.6. Distance from Credit Source

Mulatu et al. (2020) found that distance between households' residences and microfinance service provision centers was a significant negative factor at the 5% level on farmers' access to credit. The probit model result showed that every kilometer distance from the institution reduced the likelihood of household participation in the credit service by about 1.8%, assuming all other variables remained constant. Gebeyehu et al. (2019) also found that farmers' perceptions of the distance between credit institutions and their homes had a negative and significant effect at 1% level on the likelihood of credit access. The likelihood of obtaining agricultural credit from a formal source decreased by 8.85% for every additional kilometer traveled. Farmers who faced a long distance between their home and the credit institution were less likely to obtain credit. These results were in line with those reported by Tang et al. (2017), who found that every kilometer between the nearest bank and the village reduced the likelihood of borrowing credit from formal lenders by 1%. Furthermore, Mulatu et al. (2020) stated also that the distance between credit provision centers and households' residence had a significantly negative relationship with credit participation.

3.3.7. Livestock Owned

Number of livestock had positive relationship with access to credit and amount of loan (Mulatu et al., 2020) because lender institution suggests guaranties for securing against crop failure and other related risks to ensure loan repayment results. Furthermore, livestock was viewed as an informal collateral farmer check to enable other participants to join the community pursuing a larger loan amount since it is used for risk sharing in the event of loan default (Haji & Tilahun, 2013). In contrast, Gebeyehu et al. (2019) found that the amount of livestock in the farmer's tropical livestock unit had a significant (<1%) negative impact on the likelihood of household credit access. A unit increase in overall livestock reduced the likelihood of farmers obtaining agricultural credit by 6.074%. This result was in line with Doreen & Philip (2014) and Girma & Abebaw (2015) who found a negative relationship between the number of livestock owned by households and the probability of accessing credit.

3.3.8. Membership to Credit Institutions

The number of years of participation in formal credit also had a significant positive impact on the likelihood of accessing formal credit. A one-year increase in membership of a formal credit institution increased the likelihood of access to credit of the farmer by 3.70% (Gebeyehu et al., 2019). This result is also supported by Mpuga (2004) who found that farmers' access to formal credit institutions was positively influenced by experience of the household head in credit use. In addition, experience of credit use of farmers had a positive effect on credit access and was statistically significant in determining access to credit process at a 10% probability level (Tesfaye & Worku, 2019; Waje, 2020). This suggests that the more credit-experienced a farmer is, the easier it is to obtain formal credit.

3.3.9. Income Level

The non-and/off-farm income of the farmer was found to be a significant factor that influences farmer's access to formal credit (Argaw, 2017). The significant positive coefficient for off-farm income generation in the logit model suggested that off-farm income generation increased the likelihood of the farmer obtaining a loan from formal financing sources. Increasing off-farm activities had increased the likelihood of engaging in credit markets by 0.267. Farmers' chance of successfully participating in formal credit markets increased as their off-farm income increases (Muhongayire et al., 2013). However, E. Saqib et al. (2018) found that, although the effect was negligible, monthly income had a negative significant effect on access to agricultural credit in Pakistan. However, due to the fact that most Ethiopian farmers do not have monthly basis income, that case has not yet been revealed in Ethiopia.

3.4. Impact of Agricultural Credit Access on Productivity and Output

The agricultural sector in the modern era is critical for economic development. Existing literature introduces different approaches about impact of agricultural credits on productivity and output. Zuberi (1989) revealed that farmers could use modern agricultural technology if they were given credit for purchasing modern inputs. Many developed countries has recognized the advantages of modern agricultural technology. However, the use of modern farm technology to increase agricultural output has increased financing needs of the farmers (Mellor, 1966). The quickest way to increase agricultural production is to provide easy and cheap credit (Abedullah et al., 2009). Credit helps for disaster relief as well as the purchase of seed, fertilizer, cattle, and farm implements (Yusuf, 1984). The use of modern technology increased credit demand, which resulted in an increase in agricultural productivity among small farmers (Saboor et al., 2009). Credit availability aided the adoption of yield-enhancing technologies. Credit programs were used by

governments to boost agricultural output (Adams and Vogel, 1986). Saleem and Jan (2011) stated that credit disbursed for seed, fertilizers and pesticides, irrigation, and tractors was found to be strongly and positively correlated to agricultural gross domestic product. Credit has a positive relationship with agricultural productivity because it allows farmers to purchase superior quality or high yield variety seeds, fertilizers, and pesticides, and agricultural yield increases as a result of timely and adequate inputs (Rahman et al., 2014).

In Ethiopia, some researchers proved the strong and positive relationship between access to credit and agricultural productivity. Mukasa et al. (2017) stated that about 66.6% of Ethiopian farmers were credit constrained and if those farmers could access enough credit, their productivity would increase gradually. The model results showed that removing credit constraints would result in significant productivity gains of around 60% in Ethiopia. So, to improve agricultural and/or farm productivity, the government should provide enough credit to farmers. According to Gebeyehu et al., (2019) access to credit increases maize productivity by 26.6% via increasing the use of improved maize seed by 37.4%, fertilizer by 47.8% and hired labor by 33.6%. Therefore, the critical instrument to boost agriculture is to provide enough credit to farmers.

4. CONCLUSION

Agriculture plays a significant role in increasing national income due to the fact that the largest proportion of populations are residing in the countryside and operating farm to generate income and food. With the traditional farming system, without accessing credit, increasing farm yield is difficult. Transforming agriculture from traditional farming system to modernized systems needs credit to buy improved farm inputs. So, the access of farmers to agricultural credit is crucial to improve agricultural productivity.

Modernizing agriculture to improve productivity led to more credit demands. The farmers who demand for credit to buy seeds, pesticides, fertilizer and also cover operation costs are not accessing enough credit. The largest proportion of Ethiopian farmers are constrained from getting access to credit due to many reasons. Among these reasons, the literature mainly focused on socio-economic factors of farmers. Some researchers also revealed that risk factors and transaction costs are the main reasons that make credit access more difficult. The farm productivity would increase gradually if the existing constraints were removed and the farmers got access to credit.

Many researchers have tried to approach the issue of farmers' access to credit using different models. The mostly used models were probit and logistic regression models. Furthermore, some researchers used independent double-hurdle,

nonparametric kernel- based matching, five-nearest-neighbors matching, and radius matching models to identify factors affecting farmers' access to agricultural credit and impact of credit on farm productivity. Age, gender, education level, distance from credit institution, farm size, number of livestock owned, income level and years of membership to cooperatives were all among significant factors affecting access to credit. According to the reviewed literature, agricultural credit access had a positive impact on farm productivity.

In view of the reviewed literature, the followings are recommended to improve access of farmers to the credit in Ethiopia:

• The government should have to expand microfinance institutions to reach farmers who are in need of credit to boost their productivity.

• The women empowerment is also important so that females have fair access to credit like the male farmers.

• There is a need for further research into the impact of agricultural credit in Ethiopia, the efficiency of policy instruments in improving farmers' access to credit, and the satisfaction of farmers with the current microfinance institutions scheme.

Author Contribution Rates

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REFERENCES

Abate, G. T., Rashid, S., Borzaga, C., & Getnet, K. (2016). Rural Finance and Agricultural Technology Adoption in Ethiopia: Does the Institutional Design of Lending Organizations Matter? *World Development*, 84(March), 235–253. https://doi.org/10.1016/j.worlddev.2016.03.003

Abedullah, A., Mahmood, N., Mahmood, N., Khalid, M., & Kouser, S. (2009). The role of agricultural credit in the growth of livestock sector: A case study of Faisalabad. In *Pakistan Vet. J* (Vol. 29, Issue 2). https://www.researchgate.net/publication/26606272

Adams, D. W., & Vogel, R. C. (1986). Rural financial markets in low-income countries: Recent controversies and

lessons. *World Development*, 14(4), 477–487.
Admassie, A. (1987). A study of the factors that affect the use of agricultural credit among peasant farmers in Ethiopia: The case of two districts. *Unpublished M Sc. Thesis, Addis Ababa University, Ethiopia.*
Admassie, A. (2004). A Review of the Performance of Agricultural Finance in Ethiopia : Pre- and Post Reform Periods. *International Conference on 'The Agrarian Constraint and Poverty Reduction.,* 17–18.
Ahma, W., Djurfeldt, G., Aryeetey, E., & Isinika, A. (2010). Meeting the financial needs of smallholder farmers in Ethiopia. In *African Smallholders. Food Crops, Markets and Policy* (pp. 156–188). Wallingford, Oxfordshire, England: CAB International.
Amanuel, A., & Degye, G. (2018). Determinants of microfinance loan utilization by smallholder farmers: The case of Omo Microfinance in Lemo District of Hadiya Zone, Southern Ethiopia. *Journal of Development and Agricultural Economics, 10*(7), 246–252. https://doi.org/10.5897/jdae2016.0726
Amha, W., & Peck, D. (2019). Agricultural finance potential in Ethiopia: constraints and opportunities for enhancing the system. *Gates Open Res, 3*.
Argaw, G. (2017). Analysis of Determinants of Access to Credit among Smallholder Farmers in Edja District , Guraghe Zone , SNNPR , Ethiopia. *Journal of Economics and Sustainable Development*, 8(13), 73–80. https://core.ac.uk/reader/234647920
Asante-Addo, C., Mockshell, J., & Zeller, M. (2013). *Determinants of Farmers' Participation and Credit Constraints in Agricultural Finance Programs: Evidence from Nkoranza Districts of Ghana*.
Awunyo-Vitor, D., & Abankwah, V. (2012). Substitutes or Complements?: Formal and Informal Credit Demand by Maize Farmers in Ashanti and Brong Ahafo Regions of Ghana. *International Journal of Agriculture and Forestry, 2012*(3), 105–112. https://doi.org/10.5923/j.ijaf.20120203.05
Başer, U., & Bozoğlu, M. (2018). Determination of value-creating activities in the agricultural value chain. *Turkish Journal of Agriculture-Food Science and Technology*, 6(8), 1002-1007.
Doreen, A., & Philip, A. M. (2014). *Determinants of credit access and demand among small-holder farmers in Tigray region, Ethiopia.* Master Thesis submitted to Norwegian University of Life Sciences School of Economics and Business.
E. Saqib, S., Kuwornu, J. K. M., Panezia, S., & Ali, U. (2018). Factors determining subsistence farmers' access to agricultural credit in flood-prone areas of Pakistan. *Kasetsart Journal of Social Sciences, 39*(2), 262–268. https://doi.org/10.1016/j.kjss.2017.06.001
EEA. (2000). *Annual Report on Report on the Ethiopian Economy* (B. Degefe & B. Nega (eds.)). Ethiopian Economic Association.
Ellis, F. (2000). The determinants of rural livelihood diversification in developing countries. *Journal of Agricultural Economics, 51*(2), 289–302.
FAO. (2016). *Growth and Transformation Plan II (GTP II) (2015/16-2019/20).* Food and Agricultural Organization in the United Nations. http://www.fao.org/faolex/results/details/en/c/LEX-FAOC169444/
Gebeyehu, L., Emana, B., & Mitiku, F. (2019). Impact of Agricultural Credit on Maize Productivity among Smallholder Farmers in Hababo Guduru District, Oromia, Ethiopia. Ethiopian Journal of Applied Science and Technology, 10(2), 27–41. https://journals.ju.edu.et/index.php/ejast/article/view/2388
Gebeyehu, L., Emana, B., Mitiku, F., & Ejeta, T. T. (2019). Determinants of Access to Agricultural Credit among Small holder Maize Farmers: The Case of Hababo Guduru District, Horro Guduru Wollega Zone, Ethiopia. *International Journal of Horticulture, Agriculture and Food Science, 3*(3), 112–118. https://doi.org/10.22161/ijhaf.3.3.1
Getahun, H. (2001). Financing Small Famer Development in Ethiopia. *International Conference on African Development, 42*, 1–14. https://scholarworks.wmich.edu/africancenter_icad_archive/42
Girma, M., & Abebaw, D. (2015). Determinants of formal credit market participation by rural farm households: Micro-level evidence from Ethiopia. *Paper for Presentation at the 13 Th International Conference on the Ethiopian Economy. Ethiopian Economic Association (EEA) Conference Centre, Addis Ababa, Ethiopia.*
Guirkinger, C., & Boucher, S. R. (2008). Credit constraints and productivity in Peruvian agriculture. *Agricultural Economics*, 39(3), 295–308. https://doi.org/10.1111/j.1574-0862.2008.00334.x
Haji, J., & Tilahun, A. (2013). Impact of Microfinance on The Livelihood of Smallholders Farmers: The Case of Oromia Credit and Saving Share Company, Grawa Branch, East Hararghe Zone, Oromia National Regional State, Ethiopia. *Unpublished Doctoral Dessertation, Haramaya University, Ethiopia.*
Kuwornu, J. (2013). Agricultural Credit Allocation and Constraint Analyses of Selected Maize Farmers in Ghana.

British Journal of Economics, Management & Trade, 2(4), 353–374. https://doi.org/10.9734/bjemt/2012/2270

Mellor, J. W. (1966). *The economics of agricultural development.* Cornell Univerity of credit Press, Ithaca.

Mohamed, K. (2003). *Access to formal and quasi-formal credit by smallholder farmers and artisanal fishermen: A case of Zanzibar* (Issue 3). Mkuki na Nyota Publishers.

Mpuga, P. (2004). Demand for Credit in Rural Uganda: Who Cares for the Peasants ? *Conference on Growth, Poverty Reduction and Human Development in Africa Centre for the Study of African Economies*, 42. https://pdfs.semanticscholar.org/d10b/e2947e8a4c338ab3f1d0c07265b7aac1ea4a.pdf

Muhammed, M. A. (2013). *Formal and informal credit demand by rice farmers in the Northern region of Ghana.* Doctoral Dissertation, University of Ghana.

Muhongayire, W., Hitayezu, P., Mbatia, O. L., & Mukoya-Wangia, S. M. (2013). Determinants of farmers' participation in formal credit markets in rural Rwanda. *Journal of Agricultural Sciences, 4*(2), 87–94.

Mukasa, A. N., Simpasa, A. M., & Salami, A. O. (2017). Credit constraints and farm productivity: Micro-level evidence from smallholder farmers in Ethiopia. *In Working Paper Series No. 247. African Development Bank Abidjan, 247*, 1–40. www.afdb.org/

Mulatu, E., Geta, E., & Melaku, E. (2020). Smallholder Farmers' Credit Participation: The Case of Omo Microfinance Institution in Gimbo District of Kaffa Zone, Southern Ethiopia. *Journal of Agricultural Economics and Rural Development, 6*(3), 888–898. https://doi.org/10.11648/j.ijafrm.20200502.14

Nouman, M., Siddiq, M. F., Mohammed, S., & Hussain, Z. (2013). Socio-Economic Characteristics of Farmers on Access to Agricultural Credit in Tripura. *Journal of Agriculture, 29*(3), 469–476. https://doi.org/10.30954/2454-4132.1.2020.3

Nwaru, J. . (2004). *Rural credit market and resource use in arable crop production in imo state of Nigeria.* University of Agriculture.

Rahman, S. ur, Hussain, A., & Taqi, M. (2014). Impact of Agricultural Credit on Agricultural Productivity in Pakistan: an Emperical Analysis. *Southern Medical Journal, 3*(4). https://doi.org/10.1097/00007611-199209000-00007

Saboor, A., Hussain, M., & Munir, M. (2009). Impact of micro credit in alleviating poverty: An Insight from rural Rawalpindi, Pakistan. *Pak. j. Life Soc. Sci, 7*(1), 90–97.

Saleem, M. A., & Jan, F. A. (2011). The impact of agricultural credit on agricultural productivity in Dera Ismail Khan (District) Khyber Pakhtonkhawa Pakistan. *European Journal of Business and Management, 3*(2), 38–44.

Singh Yadav, S. (2017). Source of Agricultural Credit in India: A Conceptual Study of Indian Agricultural Credit. *An International Refereed Research Journal), 8*(3). https://www.researchgate.net/publication/328074810

Soubbotina, T. P., & Sheram, K. (2000). *Beyond economic growth: Meeting the challenges of global development.* World Bank Publications.

Tang, S., Guan, Z., & Jin, S. (2017). Formal and informal credit markets and rural credit demand in China. *4th International Conference on Industrial Economics System and Industrial Security Engineering, IEIS 2017.* https://doi.org/10.1109/IEIS.2017.8078663

Tesfaye, T., & Worku, W. (2019). Determinants of Access to Credit Among Small Scale Irrigation User Farmers in Dangla Woreda, Amhara National Regional State, Ethiopia. *Journal of Economics and Sustainable Development.* https://doi.org/10.7176/jesd/10-5-08

Vogt, D. (1978). Broadening to access credit. *Development Digest*, 16(3), 3–5.

Waje, S. S. (2020). Determinants of Access to Formal Credit in Rural Areas of Ethiopia: Case Study of Smallholder Households in Boloso Bombbe District, Wolaita Zone, Ethiopia. *Economics, 9*(2), 40. https://doi.org/10.11648/j.eco.20200902.13

World Bank. (2018). *Rural population (% of total population).* The World Bank Group. https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS?locations=ET

Yadav, P., & Sharma, A. K. (2015). Agriculture Credit in Developing Economies: A Review of Relevant Literature. *International Journal of Economics and Finance, 7*(12). https://doi.org/10.5539/ijef.v7n12p219

Yusuf, M. (1984). In Farm Credit Situation in Asia. *Tokyo: Asian Productivity Organization,* 455–494.

Zuberi, H. A. (1989). Production function, institutional credit and agricultural development in Pakistan. *The Pakistan Development Review,* 43–55.