Effect of Agglomeration Economies on Rice Production in Southeast Nigeria

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Abstract

Background: Rice forms a significant portion of food consumed in most households, and it is one of the few food items whose consumption has no cultural, religious, ethnic, or geographical boundaries in Nigeria.

Objective: This study analysed the effect of agglomeration economies on rice production in Southeast Nigeria. Specifically, the study estimated the level of agglomeration economy among rice farmers in their clusters, compared the degree of rice production concentration among different levels of agglomeration, and determined the major benefits of agglomeration economy to the rice farmers.

Methodology: The researchers applied the descriptive survey research design for the study. A multistage sampling technique was used to select the 298 respondents. Primary data were used, and data were collected through the use of a well-structured questionnaire. Data were analysed using inferential and descriptive statistics such as ANOVA, means and standard deviation and percentages.

Results: Agglomeration economy exists in the Southeast with three levels low, medium, and high and is a major benefit to the farmers. The Gini coefficient of 0.34 indicates equality in rice production among all the clusters except Abakaliki, whose result was 0.66, indicating inequality. The agglomeration location quotient is greater than one and thus greater than the national average, showing that the zone has evidence of agglomeration economies and great potential for rice export. The degree of rice production concentration among clusters is significantly different at 1%, with access to labour and farm credit having the most significant influence. The benefits of agglomeration to farmers include access to skilled labour, workable cooperatives, and low transport costs, among others.

Conclusion: Agglomeration has been of great advantage to the farmers in the study areas. Such benefits include having easy access to farm labour due to the labour pooling associated with agglomeration.

Key recommendation: Rice farmers should form cooperatives to access credit, and the government should formulate favourable agricultural policies to favour agglomeration to reduce diseconomies and increase the advantages of agglomeration economies.

Keywords: agriculture; agglomeration; determinants; production; rice

Introduction

Rice grows in all agroecological zones (AEZ) in Nigeria (Africa Rice Centre, 2011). There are six classes of rice-growing environment in Nigeria according to Longtau (2003) which include Upland, hydromorphic, Rain-fed lowland, Irrigated lowland, Deep inland water, and Mangrove swamps. Farmers adopt a particular rice production system based on topography, input, expected output, and returns. However, rice production and marketing growth in Sub–Saharan Africa has been due to an expansion of area under cultivation rather than an increase in yield (Stryker 2010).

Rice forms a significant portion of food consumed in most households and it is one of the few food items whose consumption has no cultural, religious, ethnic, or geographical boundaries in Nigeria. Currently, Nigeria is not self-sufficient in rice production but has the capacity to produce the quantity it requires and even excess for export if the production challenges are tackled. In Nigeria, the consumption per capita is 32kg indicating a 4.7kg increase in the past decade making the total consumption to be 6.4millioon tonnes in 2017 as against 3.7m/tons produced annually (Erhie 2018). Nigeria plays a vital role in rice production in the West African Sub-region with increasing production over the years, producing over 40% of the region's total production (Nwobiala & Adesope 2010). The Nigerian state is yet to attain self-sufficiency in rice hence demand is far beyond supply. Also, Nigeria's annual rice demand in 2018 was put at 7 million metric tonnes while only 56% of this demand was produced in Nigeria. Equally, the annual rice demand growth rate in Nigeria is 7.8% and the supply growth rate is 5.5% which leaves a deficit demand-supply gap of 2.3% (Food and Agricultural Organisation, 2013).

Despite the rise in domestic production, demand for rice far exceeded local production, precipitating an increase in the rice importation bill from N148 billion to as high as N917 billion, in 2016 (Odumade, 2016). This brought about a huge trade imbalance and heavy dependence on rice importation. In addition, the activities of rice smugglers are on the increase, and this has affected the federal government's effort to boost local rice production., In 2018 an estimated 2 million metric tonnes of parboiled rice was smuggled into Nigeria (Odogwu. 2018). Thus, indigenous rice producers are greatly affected. Consequently, the Nigerian government banned the importation of rice, thereby calling for increased local production to tackle the shortfall. Many other Sub-Saharan African countries despite considerable rice production gains for over 50 years are becoming increasingly dependent on rice imports as demand is outpacing domestic supply (Odogwu. 2018).

Africa produces an average of 14.6 million tonnes of paddy rice per year (1989-1996) on 7.3 million ha, equivalent to 2.6 and 4.6 percent of the world's total production and rice area, respectively. West Africa has the greatest rice area in Africa (56.5 percent), i.e., about 3.7 million ha. (Oteng & Sant 1997) and Nigeria is the leading rice producer in the region. Currently, according to FAOSTAT (2021), Africa ranks third with a decreased production from 4.6 % to 3 % of the global rice production. FAOSTAT shows that Nigeria's rice production trends have been unsteady, averaging 3mmt between 1994 and 2009 but increased significantly to 5.4mmt in 2012, 6.2mmt in 2015, and peaked at 8.4mmt in 2018. Unfortunately, the production has started to decline since 2019 and may likely nose-dive more due to the current insecurity in the country facing the farmers. Africa's inability to reach self-sufficiency in rice is a result of several constraints in the rice production industries which require redress to curb the trend of overreliance on imports. This will satisfy the increasing demand for rice in areas where the potential of local production resources is exploited at the local levels as seen in agglomeration economies. This research examines agglomeration activities in rice production in Southeast Nigeria

The primary ideology of agglomeration economies among farmers is that production and processing are better facilitated when there is an effective cluster of linked farming activities. The concept of agglomeration economies is akin to the explanations and ideas of economies of scale and network effects respectively (Omeje et al., 2018). Omeje et al. (2018) showed that the benefits of agglomeration among farmers extend to diversification, access to information, skills, technology and innovation as well as access to farm credit. Agglomeration economies therefore trigger those benefits which result from the concentration of related economic activities in a particular location, which could be from either a reduction in input cost or an increase in output. Some agglomeration economies are specific to a particular sector or industry. Others are general in the sense that they are realized by all firms operating in the same geographic area regardless of their industries. Economic agglomeration refers to a decrease in production and marketing costs that comes about whenever economic activities are located in the same place. Marshall (1920) was the originator of the concept, which he dubbed "neighbourhood effects of the localization of industry." Marshall pointed out the benefits of agglomeration to include knowledge or skills spill-over, reduction of labour costs, lower prices of inputs, and lower prices because of increased competition.

Unarguably, some advantages of agglomeration could turn to disadvantages if not properly coordinated and vice versa. While rice farmers cluster at a particular location to benefit from agglomeration economies, a rise in the cost of renting arable land is likely to occur as soon as demand becomes higher than supply. Etowa and Nwido (2019) also reiterated the importance of reserving land for agricultural production, while some hectares of agricultural land is gradually converted to low-density residential, commercial, and industrial uses (Atu et al., 2012). To accommodate residents who are pulled by agglomeration, the lesser agricultural land is further left to suffer higher demand and higher prices.

Many theories revolve around agglomeration economies. While some authors and economic theorists suggest that agglomeration might reduce coordination failures in particular sectors or locations, Weber (1909) exploited a neoclassical location approach for industries to find the optimal production location based mainly on regional endowments and transportation costs. These regional, cluster, or spaceless endowments may be explained to include: a great local market; a large supply of labour and thus the increased chance of supply and demand for labour and lower search costs; the accumulation of knowledge and human capital which lead to knowledge, skills, ideas and information spill-over between firms and individuals; the basis for distribution and growth of diversification; the quicker diffusion and adoption of innovation; and the quicker access to credit facilities among farmers as well as between farmers and formal credit institutions. Also related to this conceptualization is the general equilibrium theory of spaceless economics which would then be a special case in which transport costs are zero and therefore disregarded and all inputs and outputs are perfectly mobile (Lang, Deflorin, Dietl, & Lucas (2014). The mobility in this context means that needed resource inputs are not only available but also accessible and that the market for output is also not a problem. These elements of mobility could be found among rice farmers in cluster areas because it is easier for farm and off-farm activities to do well under this arrangement. It can also trigger robust value-chain activities hence by-product of one enterprise could be the raw material for another enterprise in such a space-less arrangement.

Objective of the study

The broad objective of the study was to examine the effect of agglomeration economies on rice production in southeast Nigeria. The specific objectives are to:

1. estimates the levels of agglomeration economy among rice farmers in their clusters,
2. compare the degree of rice production concentration among different levels of agglomeration economies,
3. identify major benefits of agglomeration economies to the rice farmers.

Methodology

The researchers used a descriptive survey in this study to collect data that explained the effect of agglomeration economics on rice production in Southeast Nigeria. The southeast zone is made up of five states, namely, Abia, Anambra, Ebonyi, Enugu, and Imo. The zone has a rural population density of 173 persons per square kilometer. The zone is home to many agricultural products such as palm oil, kernel, rice, yam, maize, sweet potatoes, and fruits. The zone has a total land mass of 10,952,400 hectares with over 22 million people within Nigeria's estimated population of 206,571,911 people (United Nations data, 2010).

Sampling Technique

The multi-stage sampling technique was used for the selection of respondents as depicted in Figure 3.2. In the first stage, Anambra, Ebonyi, and Enugu States were purposively selected due to the high density of rice farmers clusters in the areas. In the second stage, two Local Government Areas (LGAs) that are predominantly engaged in cluster- rice farming were purposively selected from each of the states. These include Ayamelum and Awka North LGA in Anambra State, Izzi and Abakiliki LGA in Ebonyi State, and Aninri and Uzo-Uwani LGA in Enugu State. In stage three, one heavily rice cluster area was selected from each of the selected clustered areas. Finally, 50 respondents were heads or representatives of the rice farming households were selected randomly, making a total of 300 respondents.

Data Collection

Primary data were collected using a structured questionnaire. The questionnaire was pretested before using it for the field survey. The research instrument (questionnaire) was designed to elicit information on farmer's socio-economic characteristics like gender, age, marital status, household size, number of plots owned, number of plots allocated to rice farming, number of plots allocated to other crops farming, the quantity of rice produced annually, the quantity of other crops produced, how long have they been in the rice farming enterprise, the source of farm labour, membership of the cooperative society, source of capital, cost of house rent, access to skill spill over, double taxation, exploitation middlemen. The questionnaire was validated in line with the study objectives by the research laboratory unit of the Department of Agricultural Economics, University of Nigeria, Nsukka.

Data Analyses

Objective (i) was analyzed using the Agglomeration Location Quotient (LQ).
Objective (ii) was achieved with Gini Coefficient.
Objective (iv) was achieved using a Likert scale rating.

Results and discussion of findings

The gender distribution of the rice farmers shows that male farmers constitute 85.5% while female farmers make up the remaining 14.5%. Therefore, there are mostly male rice farmers than female rice farmers in the rice clusters in the Southeast. This may be due to the fact that most tedious aspects of farming is mostly done by males. This result corroborates the findings by Ayanwale and Amusan (2014) where it was reported that rice production in Osun State was dominated by male farmers who constituted 62.0% of the farmers in the area. The male dominance in rice farming in the area was attributed to the fact that the males are naturally stronger than the women and therefore, more inclined to dominate in the rice farming business. Sadiq et al. (2021) attributed the dominance of males in rice farming as the consequence of cultural and religious barriers, gender discrimination, and gender stereotyping which hinders women's access to and control over rice productivity resources such as land and labour. This finding clearly indicates that gender is a major factor in enterprise selection and production in the Southeast rice clusters/agglomeration areas.

Table 1: Levels of agglomeration economy among rice farmers in the study areas

Cluster	Location Quotient	LQ(Approx.)
Adani	1.287487533	1.287
Aninri	1.243090482	1.243
Izzi	1.650292063	1.650
Abakaliki	1.226763066	1.226
Awka	1.036541132	1.036
Anaku	1.042768451	1.043

The analysis of variance (ANOVA) results in Table 1 show that the location quotients of the rice clusters have an F-value of 11.965 and a P-value of 0.00 which is significant at 0.05 level of significance. This implies that there is a significant difference in the mean location quotients of the six rice clusters in the Southeast region of Nigeria. That is, the differences in the location quotients of the six rice clusters are not by chance. Therefore, the level of agglomeration economies among the farmers in the rice clusters is significantly different. Duncan's multiple range test (MRT) was used to discriminate and ascertain the clusters with significantly different location quotients. The results show that the location quotients of Awka (Awka North) and Anaku (Ayamelum) are the lowest and are not significantly different from each other but significantly different from the others. The location quotients of Abakiliki (Ebonyi), Aninri(Enugu) and Adani(Uzo-umani) are not significantly different from each other but are statistically different from those of Awka and Anaku. The location quotient for Izzi (Ebonyi) is the highest and significantly different from the others at a 0.05 level of significance.

Table 2 ANOVA Results for Agglomeration Degree of Rice Production Concentration

Variable	Sum of Squares	df	Mean Square	F-cal	P-value
Between Clusters	0.936	5	0.187	22.424	0.000
Error	0.250	30	0.008		
Total	1.187	35			

The ANOVA test for the differences in the degrees of rice production concentration among the farmers in the six clusters in Table 2 showed an F-cal value of 22.424 and a p-value of 0.00,

indicating a significant difference in the degree of concentration of rice production in the six rice clusters. This implies that the degree of rice production concentration in the clusters is not the same in the rice clusters. The Duncan multiple range posthoc test shows that Aninri and Awka have the same degree of production concentration, but are significantly different from the degree of production concentration in Adani, Izzi, Abakiliki, and Anaku. This validates the earlier findings from the Gini coefficients that there is equality in rice production concentration among farmers in Aninri and Awka clusters.

Table 3 Mean Analysis of Benefits of Agglomeration Economies to Rice Farmers

	Location						
Variable	**Adani**	**Aninri**	**Izzi**	**Abakilik**	**Awka**	**Anaku**	**Total**
Low transport cost	3.35	3.22	2.45	2.44	2.68	3.14	2.84
Access to skills/skill spillover	2.20	2.12	3.84	3.92	3.76	3.22	2.64
Low cost of input through hiring	3.79	2.92	3.58	3.68	3.72	3.40	3.59
Labour market availability all seasons	3.46	2.58	3.54	3.66	3.70	3.50	3.61
helps to diversify into other areas	3.10	3.20	3.46	3.28	3.34	3.14	3.51
Easier access to farm credits	2.93	2.83	3.35	3.66	3.45	3.06	3.24
Availability of working cooperatives	3.89	3.60	3.64	3.62	3.78	3.70	2.70
Easier access to government incentives and interventions like FADAMA	3.64	3.22	3.23	3.14	3.06	3.02	3.21
Easy communication of farm information	3.20	3.46	3.24	3.28	3.58	3.60	3.39
Easy marketing of rice products	3.90	3.70	3.80	3.83	3.62	3.22	3.68

From Table 3, it could be observed that the low cost of transport was considered major benefit of the agglomeration economies in Adani (3.35), Aninri (3.22), Awka (2.68) and Anaku (3.14). low cost of transportation was not considered a major benefit in Izzi and Abakiliki, all in Ebonyi State. Access to skills and skill spill over was considered major benefit of the agglomeration economies in Izzi (3.84), Abakiliki (3.92), Awka (3.76) and Anaku (3.22). however, access to skills and skill spill over is not a major benefit in Adani and Aninri. Abakiliki ranked 1st in access to skills and skill spill over, followed by Izzi in 2nd, then Awka in 3rd and Anaku in 4th. Low cost of input through hiring was a major benefit of the agglomeration economies for the farmers in the six clusters. Adani ranked 1st in low cost of input through hiring, followed by Awka in 2nd, then Abakiliki in 3rd, Izzi in 4th, Anaku in 5th and Aninri in 6th. The table also revealed that labour market availability all seasons was a major benefit of the agglomeration economies for all the farmers in the six rice clusters. In terms of labour availability, Awka ranked 1st in access to labour all seasons, this is followed by Abakiliki in 2nd, then Izzi in 3rd, Anaku in 4th, Adani in 5th and Aninri in 6th.

The findings of this study on access to skill, skill spill over and availability of labour market corroborate the findings of Bolter and Robey (2020) on the key benefits of agglomeration economies and clusters. Bolter and Robey (2020) revealed that agglomeration creates knowledge and skill spill overs in which rice firms, farmers and workers learn from each other. This also motivates the investment in human capital development because farmers, workers, and rice firms are aware they will benefit from improved levels of skill acquisition and education. They

emphasized that the most important drivers of agglomeration are the educated workforce, the pool of skilled labour force, and the local input suppliers. There is also the provision of unskilled or low-skilled labour force which tends to enhance the productivity of high-skilled workers. Alcacer and Chung (2014) asserted that labour market pooling is the most important mechanism for firm entry into agglomeration. They noted that a more diversified and better-qualified labour force encourages firms in agglomeration economies. Therefore, skilled labour and skill spillovers are very important for the existence and sustenance of the rice agglomeration economies of the Southeast region of Nigeria since skilled and diversified labour are the major drivers for rice farmers.

Diversification into other rice enterprises and value chains in the rice clusters was a major benefit of the agglomeration economies to all the farmers in the six rice clusters. The rice value chains, and other enterprises include businesses such as rice marketing, rice processing, etc. Izzi clusters ranked 1st, followed by Awka in 2nd, then Abakiliki in 3rd, Aninri in 4th, Anaku in 5th and Adani in 6th. Easier access to farm credit was also considered a major benefit of the agglomeration economies by the farmers in the six rice clusters in the Southeast region of Nigeria. Abakiliki rice clusters ranks 1st as the beneficiary, followed by Awka in 2nd, then Izzi rice cluster in 3rd, Anaku rice cluster in 4th, Adani in 5th, and Aninri in 6th. The benefits of diversification in the agglomeration are also reaffirmed by Ibrahim (2017) who maintained that the cluster of similar agricultural farms attracts other private sector agribusinesses to set up processing plants in the cluster areas/zones due to high food production within the cluster. The processing plants process farm products and commodities to food products. Ibrahim (2017) emphasized that the cluster of firms induces concentration of economic activities including markets for farm products as they demonstrate high operational economies of scale and take advantage of the agglomeration.

The diversification into other rice enterprises and value chains is driven by the rice clusters and the consequent agglomeration it fosters. Ibrahim (2017) highlighted the benefits of agglomeration in the diversification of enterprises and value chains of the Abakiliki rice cluster. Ibrahim noted that "because farmers in Ebonyi produce rice in large quantities, there was the need for milling centres to be situated across local government areas to provide easy access to the mills. This need gave rise to the establishment of such centers by cooperative societies in virtually every local government area. The milling machines were situated in such a way that they formed a cluster for milling the rice produce of the state. The center is also a trading market for rice. Aside from these sub-milling centers scattered in various parts of the state, there is a central mill known as Abakaliki Rice Milling Industry located within the state capital along Ogoja Road. The Abakaliki rice milling industry provides services for farmers over a huge area. This large cluster of rice milling industry (the Abakaliki mill and smaller ones) is owned and managed by private individuals and cooperative societies."

Also, the results in the table show that the availability of workable corporative societies was a major benefit of the agglomeration economies to all the farmers in the six rice clusters. Adani ranked 1st in access to workable cooperative societies, followed by Awka in 2nd, then Anaku in 3rd, Izzi in 4th, Abakiliki in 5th and Aninri in 6th. The corporative societies offer loans to members at low interest rates and also position the clusters to attract government incentives to the rice farmers. This finding is corroborated by the findings of Osabuohien et al. (2018) who emphasized on the role of workable cooperative societies in enhancing rice productivity in Nigeria. They studied the strategic roles of the Rice Growers Association of Nigeria (RGAN) in promoting rice production

and processing in Ogun State, Nigeria. RGAN is a cooperative society that supports members through agglomeration economies, connecting members directly to rice value chains involving rice production, processing, distribution, and marketing of paddy and other rice products. According to Osabuohien et al. (2018), RGAN is open to members of all categories and dominated by small-scale rice farmers who make as small as an annual levy of two thousand naira but benefit much from the cooperative society, including access to loan credits. The cooperative society also presents the common interests of the members to the government through the Agricultural Development Programme (ADP) and through the Ministry of Agriculture, which are government-dedicated agencies on food and agriculture.

The benefits and importance of a workable cooperative were also reiterated by Sadiq et al. (2022). They revealed in their study on rice farming in the North Central region of Nigeria that most of the farmers in the farming zones (clusters) in the region belong to cooperative societies and rice farmers association. Their study shows that the farmers who belong to the cooperative societies and rice farmers associations benefit from bulk input discounts, timely access to credit, bargaining power, technical advice and information, marketing advice, and market bargaining power. The rice farmers' access to credit facilities through cooperative societies and rice farmers' associations was also supported by Odu et al. (2019) who observed that rice farmers in Niger State who have access to credit facilities did so through informal credit sources. They indicated that these informal credit sources include farmers' cooperative societies and associations which provide credit loans at minimized interest for members. Furthermore, the results revealed that easier access to government incentives and interventions like the FADAMA was considered a major benefit of the agglomeration economies by the farmers in the six rice clusters. Incentives and interventions by the government help to boost rice farming and rice production, including the rice value chains. The farmers in the Adani rice cluster ranked 1st in the ease of accessing government interventions and incentives, this is followed by the Izzi rice cluster in 2nd, the Aninri rice cluster in 3rd, the Abakiliki rice cluster in 4th, the Awka rice cluster in 5th and Anaku rice cluster in 6th. The ease of communication of farm information on rice production was also considered a major benefit of the agglomeration economies by the farmers in the six rice clusters, though with different rates of interest. Anaku ranked 1st in access to farm information within clusters, followed by Awka in 2nd, Aninri in 3rd, Abakiliki in 4th, Izzi in 5th and Adani in 6th. The ease of marketing rice products was also agreed as a major benefit of the agglomeration economies by the farmers in the six rice clusters in the Southeast region of Nigeria. This may be due to the proximity of rice markets to the rice farms such that it is easier to market the rice products without worrying about distant markets to take the products to. The Adani rice cluster ranked 1st in easy access to the marketing of rice products, this is followed by Abakiliki rice cluster in 2nd, then the Izzi rice cluster in 3rd, the Aninri rice cluster in 4th, Awka rice cluster in 5th and the Anaku rice cluster in 6th.

These findings on the marketing of rice products corroborate the findings of Anthony et al. (2021) who revealed that rice farmers in Abuja have access to formal and informal rice markets due to their membership of farmers' cooperative society or rice farmers' association. They posited that an increase in participation in rice marketing is a key determinant to lifting small-holder rural rice farmers out of poverty. The study further shows that rice farmers joining the rice clusters do so to benefit from government incentives and interventions in rice farming through government policies like the FADAMA programme. However, studies by the Food and Agricultural Organization (FAO, 2013) show that the expected government incentives and interventions in rice farming have

not been sufficient to significantly improve rice farming in Nigeria. The agency's use of the observed Nominal Rate of Protection (NRP) tool to measure the level of government incentives and disincentives in rice production in Nigeria shows that rice farmers in Nigeria receive disincentives in the rice value chain, leading to market inefficiencies.

Conclusion and Recommendations

Agglomeration has been of great advantage to the farmers in the study areas. Such benefits include having easy access to farm labour due to the labour pooling associated with agglomeration. Access to land was also easier because most of the agglomeration areas in the southeast were reserved by the government. The location quotients for the six rice clusters were all greater than 1.0, indicating that the agglomeration economies of the three states are greater than the average. Izzi cluster has the highest location coefficient of 1.65, this is followed by Adani with a location quotient of 1.29. Awka has the lowest location quotient, 1.037, followed by Anaku with a location quotient of 1.043.

The degree of rice production concentration among the different levels of agglomeration economies showed that the six clusters in the selected three states are dominated by rice production, hence the inequality gap between rice enterprise (rice production and processing) and other aspects of farming. The major factors that influence farmers to join rice clusters in the Southeast agglomeration areas include access to labour, access to farm credit, access to shared input, availability of incentives from the government, and higher rice productivity. Also, access to farm credit and the availability of incentives from the government have a significant influence on the level of agglomeration in the Southeast.

The major benefits of agglomeration economies to the rice farmers in the Southeast clusters were low cost of transportation, access to skills, and skill spillover. The low cost of input through hiring was a major benefit of the agglomeration economies for the farmers in the six clusters. Adani ranked 1st in low cost of input through hiring, followed by Awka in 2nd, then Abakiliki in 3rd, Izzi in 4th, Anaku in 5^{th,} and Aninri in 6th. Diversification into other rice enterprises and value chains in the rice clusters was a major benefit of the agglomeration economies to all the farmers in the six rice clusters. Based on the findings of this study, it was found that an agglomeration economy is a tool that can be used to motivate the rice sector to optimal productivity. The government whose responsibility it is to design and promulgate good farm policies such as land tenure system policy, price policy, trade policy, marketing, credit, crop insurance, water and farm power policy as well as structural transformation should urgently review the agglomerations economies and diseconomies in a manner that will improve the benefits and solve problems emanating from the agglomeration activities such as the high cost of renting farmland, insufficient irrigation, and exploitation (policies). Finally, further studies should be conducted in other parts of Nigeria for comparison.

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