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Availability of Rice Markets and Increase Income Generation among Farmers in Cross River and Ebonyi States, Nigeria

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Abstract

This study explored the relationship between availability of rice markets and income generation among farmers in Cross River and Ebonyi States, Nigeria. Specifically, the study aimed was to ascertain how availability of rice markets relates with increase in income generation among farmers. One research question and one null hypothesis were formulated to guide the study. Relevant literature was reviewed in line with the topic. The study was anchored on Participatory Theory. A mixed-methods research design was adopted, while purposive, simple random, and systematic sampling techniques were used to select 800 respondents. Data were collected through structured questionnaires and Key Informant Interviews (KIIs). Quantitative data were analysed using the Pearson Product-Moment Correlation Coefficient, while qualitative data were analysed thematically. The findings revealed that there was a very strong positive and statistically significant relationship between availability of rice markets and income generation among farmers ($r = 0.974$, $p < .05$), as the calculated r-value was greater than the critical r-value of 0.062. The study further showed that access to organized markets, cooperative marketing systems, and direct buyer access significantly improve farmers' income levels. The study concluded that availability of rice markets plays a critical role in enhancing income generation, improving rural livelihoods, and strengthening the economic wellbeing of farmers in Cross River and Ebonyi States. The study recommended that government and agricultural development agencies should establish and strengthen organized rice marketing systems, improve rural market infrastructure, and support farmers' cooperatives through financial and institutional assistance to enhance income generation and sustainable rural development.

Keywords: *Rice markets, income generation, farmers, agricultural marketing, rural livelihoods, Cross River State, Ebonyi State.*

Introduction

The availability of rice markets remains a critical factor in promoting agricultural development and increasing income generation among farmers across the world (Terdoo & Feola, 2016). Market availability provides farmers with opportunities to sell their produce, access competitive prices, reduce post-harvest losses, and participate more effectively in agricultural value chains (Ibrahim, Barau, & Abdullah, 2025). Where rice markets are accessible and functional, farmers are able to convert their agricultural output into financial returns that improve household welfare and livelihood outcomes (Terdoo & Feola, 2016). The existence of organized rice markets also encourages farmers to increase production because they are assured of demand for their produce and opportunities for profit generation (Ibrahim, Barau, & Abdullah, 2025). Globally, agricultural markets are recognized as important mechanisms for linking producers to consumers and facilitating rural economic growth through improved income opportunities for farming households (Terdoo & Feola, 2016).

Across many parts of the world, rice has become one of the most important staple food commodities and a major source of livelihood for millions of farming households (Terdoo & Feola, 2016). The expansion of rice markets has contributed significantly to agricultural commercialization by enabling farmers to participate in local, national, and international trade networks (Ibrahim, Barau, & Abdullah, 2025). Access to markets provides incentives for increased productivity, investment in improved production techniques, and adoption of modern farming technologies that enhance output and profitability (Terdoo & Feola, 2016). In addition, the availability of rice markets strengthens farmers' bargaining power and facilitates access to market information, which are essential for maximizing income generation from agricultural activities (Ibrahim, Barau, & Abdullah, 2025).

In Africa, rice consumption has continued to increase significantly as a result of rapid population growth, urbanization, changing food preferences, and rising demand for convenient staple foods. Recent studies indicate that urbanization and dietary transitions across the continent have contributed substantially to increased rice consumption among households, thereby creating greater demand for rice production and marketing systems (De Vos, Janssens, Jacobs, Campforts, Boere, Kozicka, Leclère, & Havlík, 2024). This growing demand has expanded market opportunities for rice farmers and enhanced their potential to generate income through increased sales and participation in agricultural commercialization processes (Saha, Harris, Nisbett, & Thompson, 2024). The availability of rice markets enables farmers to sell their produce more efficiently, reach larger consumer populations, and obtain better returns on their investments in rice production. In addition, effective market access promotes participation in value-chain activities such as processing, packaging, transportation, and distribution, thereby creating additional sources of income for farmers and other stakeholders within the rice sector (De Vos, Janssens, Jacobs, Campforts, Boere, Kozicka, Leclère, & Havlík, 2023). Consequently, rice markets have become important mechanisms for improving rural livelihoods, promoting agricultural commercialization, and reducing poverty among farming households across many African countries (Audu, 2025).

Despite these opportunities, the benefits derived from rice markets are often constrained by several infrastructural and institutional challenges. Market performance is frequently affected by poor transportation networks, inadequate storage facilities, limited access to market information, and weak market integration, all of which reduce farmers' ability to maximize profits from rice production (Benassai-Dalmau, Voukelatou, Schifanella, Fiandrino, Paolotti, & Kalimeri, 2025). In many rural communities, difficulties in accessing profitable markets continue to limit the economic benefits associated with rice farming. Nevertheless, where market systems are efficient and well-coordinated, rice farmers tend to experience improved productivity, increased sales volumes, and higher income levels compared to those operating under conditions of limited market access (Saha, Harris, Nisbett, & Thompson, 2024). Furthermore, improved market accessibility encourages farmers to expand production and invest in modern farming practices, thereby contributing to sustainable agricultural development and enhanced household welfare (Audu, 2025).

In Nigeria, rice occupies a strategic position within the agricultural sector due to its importance as both a staple food and a source of employment for millions of people (Ibrahim, Barau, & Abdullah, 2025). Government initiatives aimed at increasing domestic rice production have further stimulated the development of rice markets and strengthened value chain activities across the country (Ibrahim, Barau, & Abdullah, 2025). The availability of rice markets provides farmers with opportunities to sell their produce through local markets, cooperative societies, wholesalers, processors, and other market intermediaries, thereby enhancing income generation (Nwahia, 2021). Access to rice markets also facilitates commercialization by encouraging farmers to produce beyond subsistence levels and engage more actively in market-oriented agriculture (Ibrahim, Barau, & Abdullah, 2025). As market opportunities expand, farmers are better positioned to increase production, improve profitability, and strengthen their economic wellbeing (Nwahia, 2021).

In Cross River and Ebonyi States, rice farming constitutes an important livelihood activity and a significant source of household income for many rural families (Effiong & David, 2024; Nwahia, 2021). Ebonyi State is widely recognized as one of the leading rice-producing states in Nigeria and has developed extensive rice production and marketing activities that contribute substantially to the state's economy (Nwahia, 2021). The presence of rice markets within the state provides farmers with opportunities to sell harvested rice, interact with buyers, and participate in value chain activities that enhance income generation (Nwahia, 2021). Market availability also encourages increased investment in rice production because farmers are more confident that their produce will reach consumers and generate economic returns (Nwahia, 2021).

Similarly, Cross River State possesses favourable ecological conditions that support rice cultivation and related agricultural enterprises (Effiong & David, 2024). The availability of local and regional rice markets in the state provides important avenues through which farmers can market their produce and improve household earnings (Effiong, 2024). Through participation in rice production and marketing activities, farmers are able to generate income, support household needs, and improve their overall standard of living (Effiong & David, 2024). Access to market opportunities also promotes greater participation in rice value chain activities such as processing and distribution, thereby creating additional sources of income for farming households (Effiong, 2024).

Although rice production remains an important economic activity in both Cross River and Ebonyi States, variations in market accessibility continue to influence the extent to which farmers benefit financially from rice farming (Effiong, 2024; Nwahia, 2021). Factors such as transportation facilities, storage infrastructure, market information systems, and buyer availability often determine the level of participation and income generation among rice farmers (Ibrahim, Barau, & Abdullah, 2025). Therefore, understanding how the availability of rice markets influences income generation among farmers is essential for promoting agricultural development, strengthening rural livelihoods, and enhancing poverty reduction in Cross River and Ebonyi States.

Statement of the Problem

Rice farming remains one of the most important agricultural activities supporting income generation, employment creation, livelihoods, and food production in Cross River and Ebonyi States. Despite its importance, many rice farmers continue to experience low income and poor socio-economic wellbeing. A significant proportion of farming households struggle to meet basic needs, resulting in poor housing conditions, inadequate healthcare, limited educational opportunities for their children, food insecurity, and generally low living standards. These challenges have contributed to persistent rural poverty and weakened household welfare among rice-producing communities.

As one of the most consumed staple foods in Nigeria, rice contributes significantly to household income and rural economic development. However, the low income generated by many rice farmers has negatively affected their ability to improve their livelihoods and invest in productive activities. Many farmers are unable to expand farm size, adopt improved technologies, employ labour, or increase productivity because the returns from rice farming are often insufficient to support both household needs and future agricultural investments. This situation threatens the sustainability of rice production and rural economic development.

The low income experienced by rice farmers is associated with several production and institutional challenges. Many farmers operate on a small scale and face unstable prices, poor bargaining power, inadequate market information, and limited access to profitable market outlets. In addition, poor transportation networks, inadequate storage facilities, post-harvest losses, restricted access to agricultural credit, weak cooperative structures, climate-related challenges, and ineffective extension services further reduce farmers' earnings. The cumulative effect of these problems has adversely affected household welfare, food security, healthcare access, educational attainment, and overall quality of life among rice-farming households.

Although federal and state governments have introduced agricultural support programmes such as the Anchor Borrowers' Programme, improved seed distribution initiatives, mechanisation support, and extension services, the expected improvement in farmers' income has not been fully realised. Many rural farmers remain unable to generate adequate income due to poor implementation of policies, inadequate awareness, bureaucratic bottlenecks, and unequal access to support services. Consequently, poverty and poor living conditions remain prevalent among many rice-producing households in Cross River and Ebonyi States.

Furthermore, inadequate access to reliable rice markets continues to limit farmers' income generation. Where farmers are unable to access profitable markets, they often sell their produce at unfavourable prices, resulting in low earnings and limited opportunities for economic advancement. This has made it difficult for many farmers to improve their standard of living, acquire productive assets, access quality healthcare, support their children's education, and adequately provide for their households.

Adewuyi and Bakare (2018), reported that improved market access contributes positively to farmers' earnings and household welfare. However, their study was conducted outside Cross River and Ebonyi States and did not specifically examine how the availability of rice markets influences income generation among rice farmers within the unique socio-economic realities of the two states. Consequently, there is limited empirical evidence on the relationship between availability of rice markets and income generation among farmers in Cross River and Ebonyi States. Therefore, this study seeks to fill this gap by ascertaining the relationship between availability of rice markets and increase in income generation among farmers in Cross River and Ebonyi States. The study aims to provide empirical evidence that will guide policy formulation and interventions aimed at improving farmers' income, reducing rural poverty, and enhancing the socio-economic wellbeing of farming households.

Research questions:

How does availability of rice markets relate with increase in income generation among farmers in Cross River and Ebonyi States?

Objective:

The main thrust of this study was to ascertain how the availability of rice markets relates with increase in income generation among farmers in Cross River and Ebonyi States

Hypotheses:

H_o: Availabilty of rice markets does not significantly relate with increase in income generation among farmers in Cross River and Ebonyi States

Literature Review

Availability of rice markets and increase in income generation

Availability of rice markets refers to the presence, accessibility, functionality, and efficiency of formal and informal outlets through which rice farmers sell paddy or processed rice, interact with buyers, and integrate into agricultural value chains, thereby converting farm output into monetary income (Luc Christiaensen, Demery & Kühl, 2018). Market availability is conceptualized not merely as physical proximity to trading centers but as a multidimensional construct encompassing road and transportation infrastructure, buyer density, price information systems, storage and processing facilities, institutional linkages, and transaction reliability, all of which determine farmers' capacity to commercialize production (Ibrahim, Barau, & Abdullah, 2025). In rice-dependent rural economies such as Nigeria, where rice is both a staple and a cash crop, access to functional and structured markets is particularly crucial because farmers' income outcomes are highly dependent on their ability to sell beyond subsistence consumption (Ezeudu & Obimbua, 2024). This multidimensional perspective aligns with broader agricultural market systems research, which emphasizes that effective market structures are essential for facilitating income opportunities and reducing rural poverty (Zhuang, Fan & Birner, 2021).

On the other hand, income generation among farmers is seen as the ability of households to earn monetary returns from agricultural production through crop sales, value addition, wage employment, or participation in market systems, enabling them to meet consumption needs, invest in productive assets, and improve overall living standards (Ukwuaba, Ibe, Onyekwe, Adebayo, Bamijoko, Ukwuaba & Asogwa, 2025). Farm income is widely recognized as a key indicator of livelihood sustainability, welfare improvement, and poverty reduction among rural households (World Bank, 2021). Even when production levels are high, farmers remain economically vulnerable if access to functional markets is limited or exploitative, underscoring the fundamental role that market availability plays in shaping income outcomes (Gebrehiwot, Gashu & Dixon, 2023; Sanusi & Salau, 2018).

Furthermore, empirical research demonstrates a strong and positive relationship between rice market availability and income generation among farmers in Nigeria. Ukwuaba, Ibe, Onyekwe, Adebayo, Bamijoko, Ukwuaba and Asogwa (2025) observed that rice farmers with greater access to structured markets including cooperative marketing centers and urban buyer networks, experienced significantly higher incomes compared to farmers restricted to small local markets. Their analysis showed that proximity to organized sales outlets, frequency of market participation, and presence of multiple buyers were significant predictors of higher cash returns, illustrating how market availability directly affects income.

Similarly, Ibrahim, Barau and Abdullah (2025) reported that Nigerian rice farmers with stronger linkages to formal and informal markets achieved greater income diversification and higher total farm revenue due to increased sales volumes and better price realization. Access to competitive buyers and transparent pricing enabled farmers to negotiate better terms, reduce exploitation by middlemen, and realize higher net income. Ezeudu and Obimbua (2024) reinforced this view, highlighting that rice farm households engaged in peri-urban and regional markets achieved higher income than those limited to rural village sales because they could capture a larger share of the value chain. Historical evidence also supports the relationship between market participation and income generation. For example, Ogunleye (2018) found high levels of output market engagement (mean participation of 89%) among rice farmers in Ogun State, and that determinants such as farm size, education, fertilizer use, and transport costs significantly influenced participation which is a necessary precursor to income generation through market sales (Ogunleye, 2018). Although this study focused on participation patterns, it provides foundational evidence that market availability enables extensive engagement, which sets the stage for income gains.

Moreover, the impact of rice market availability on income generation is multifaceted. First, it enhances price discovery and competition, which directly increases monetary returns from each unit of rice sold. Idu, Sennuga, and Owoicho (2025) found that farmers in Nasarawa State with timely access to market information and multiple buyers earned up to 30% higher income than those without access. Access to pricing information and competitive buyers allows farmers to strategically plan sales and maximize revenue. Secondly, market availability reduces transaction costs and post-harvest losses. Minten, Tamru, and Stifel (2019) highlighted that farmers connected to functional marketplaces with storage and transportation support can delay sales, improve grain quality, and target higher-value buyers, resulting in stable and higher incomes. In Nigeria, farmers linked to cooperative storage facilities and rice mills reported better gross margins over multiple seasons because they could avoid distress sales at low prices (Sanusi & Salau, 2018). Thirdly, availability of structured markets facilitates value addition, further increasing income. Access to grading, processing, and packaging facilities allows farmers to command price premiums for higher-quality rice. Abubakar Muhammad Bichi, Hussaini Yusuf Ibrahim, and Emmanuel Ada Ojoko (2025) observed that farmers participating in trade credit programs connected to markets earned higher returns, as credit enabled investments in storage, mechanization, and quality improvement.

Availability of rice markets promotes income generation through several interconnected mechanisms. Farmers with market access are more likely to commercialize surplus production rather than consume it entirely at home, increasing cash inflows and income stability (Ukwuaba et al., 2025). Market presence enhances bargaining power through competition and transparency, ensuring farmers receive fairer prices (Ezeudu & Obimbua, 2024). Furthermore, access to market information reduces asymmetries in pricing knowledge, enabling farmers to optimize the timing of sales and improve revenue (Idu et al., 2025). Market participation also connects farmers to credit and input networks, facilitating investments that expand production and further increase income (Bichi et al., 2025). While a complementary regional perspective is provided by Guillaume, Matty, Aminou, Frédéric and Patricio (2020), whose synthesis of West African rice value-chain upgrading highlights that increases in farmers' incomes depend critically on improvements in integration into markets. Their review shows that where farmers supply higher-quality paddy, farmgate prices increase because domestic rice becomes competitive in the market with imported brands.

Bichi, Ibrahim and Ojoko (2025), postulated that rice farmers participating in trade credit arrangements tied to market access earned significantly higher income from rice cultivation compared to non-participants, with trade credit increasing income by approximately ₦62,864.82 per hectare, highlighting how institutional support linked to market engagement can directly raise farm revenue (Bichi, Ibrahim, & Ojoko, 2025). This underscores that market availability, when paired with institutional financial mechanisms, enhances farmers' ability to convert production into cash returns. In a related study, Ukwuaba, Arene, and Okpukpara (2024) analyzed smallholder commercialization and household welfare among rice farmers and found that greater market participation correlates positively with household income and consumption expenditures, with a market participation index of 0.73 indicating substantial engagement in rice markets by the sample farmers (Ukwuaba, Arene, & Okpukpara, 2024).

This result confirms that when farmers are integrated into rice markets, they tend to sell larger portions of their produce, generating more income that contributes to broader welfare outcomes.

Beyond direct sales, access to market information also influences income prospects. In Nasarawa State, Idu, Sennuga, and Owoicho (2025) showed that rice farmers who access timely market price and demand information through information and communication technologies (ICTs) are better able to make strategic selling decisions, which can enhance income generation; however, socioeconomic constraints such as limited ICT access hinder this potential for many producers (Idu, Sennuga, & Owoicho, 2025). This highlights that market availability encompasses not just physical access to buyers, but also informational access that enables farmers to optimize their engagement and income returns. Further, research on rice marketing structures in Yobe State by Lawal, Ibrahim, and Adeola (2025) found that differences in marketing performance including profit margins realized by retailers versus wholesalers reflect underlying market dynamics that can influence income opportunities for farmers who sell into these systems, suggesting that well-functioning market structures with competitive pricing and multiple buyer options can lead to better income outcomes for producers (Lawal, Ibrahim, & Adeola, 2025).

Income generated through market access translates into broader socio-economic benefits for rice farmers. Higher earnings improve household food security by enabling the purchase of diverse, nutrient-rich foods beyond staples (Christiaensen et al., 2018). Households with higher market-derived incomes exhibit greater dietary diversity, fewer hunger episodes, and resilience against seasonal shocks. Income also supports educational investment; households with greater earnings can afford school fees and other educational expenses for children, enhancing human capital (Ukwuaba, Arene, & Okpukpara, 2024). Health outcomes improve as households allocate income to preventive and curative services, reducing morbidity and healthcare-related financial shocks (World Bank, 2021). Finally, income facilitates housing and asset improvements, such as renovations, electricity, water access, and durable goods, which enhance overall living standards (Ukwuaba et al., 2025).

Despite these benefits, constraints limit the income-generating potential of market availability. Poor infrastructure, insecurity, price volatility, and weak institutional coordination reduce farmers' ability to capitalize fully on market access (Ezeudu & Obimbua, 2024). Even when markets exist, high transportation costs and exploitative pricing structures can erode income, particularly for smallholders lacking bargaining power (Olayemi, Adebayo, & Ogunleye, 2021). These challenges indicate that improving market availability must be accompanied by supportive policies, infrastructure, and institutional frameworks. The cumulative evidence indicates that availability of rice markets is a critical determinant of income generation among Nigerian farmers. Market access enables commercialization, enhances price realization, reduces transaction costs, and integrates farmers into broader value chains. The resulting income gains translate into improved wellbeing, including better food security, educational investment, healthcare access, housing improvements, and asset accumulation. Strengthening rice market availability is therefore central to enhancing both income generation and socio-economic development among rice farmers in Nigeria.

Theoretical Framework

Participatory theory

Participatory Theory was prominently advanced by scholars such as Paulo Freire in (1970) and later expanded by development theorists including Robert Chambers in (1994). The theory emerged from the belief that sustainable development and social progress can only be achieved when people directly affected by policies, programmes, and development activities are actively involved in decision-making, planning, implementation, and evaluation processes. Participatory Theory emphasizes inclusiveness, collective action, empowerment, shared responsibility, and local knowledge as essential elements for achieving meaningful development outcomes. Freire argued that people should not merely be passive recipients of development interventions but active participants capable of identifying their problems and contributing to solutions that improve their conditions of living. Chambers further stressed that local people possess valuable indigenous knowledge and practical experiences that should guide development initiatives affecting their livelihoods. The major tenets of Participatory Theory therefore include people-centered development, collective involvement, empowerment, local decision-making, cooperation, inclusiveness, and shared ownership of development processes.

The concept of Participatory Theory is therefore rooted in the assumption that development becomes more effective, sustainable, and beneficial when individuals actively participate in activities that directly affect their socio-economic wellbeing. The theory maintains that people are more likely to support, sustain, and benefit from programmes in which they are adequately involved. Participation enables individuals and groups to express their needs, contribute ideas, mobilize resources collectively, and strengthen their capacity for self-reliance. The theory also emphasizes that participation creates social inclusion, enhances accountability, strengthens cooperation, and increases the likelihood of achieving sustainable socio-economic outcomes. Through active engagement, communities become empowered to improve their livelihoods and overcome challenges affecting their wellbeing.

In the context of rice farming in Cross River and Ebonyi States, Participatory Theory provides a useful framework for understanding how the availability of markets contributes to income generation among rice farmers. The theory explains that farmers who actively participate in market activities, cooperative societies, and community-based marketing systems are more likely to improve their economic wellbeing through increased income and better market opportunities.

The availability of rice markets demonstrates the application of Participatory Theory because farmers often depend on cooperative groups, market associations, and community networks to access buyers and market information. Farmers who participate actively in organized market systems are better able to negotiate favourable prices, reduce exploitation by middlemen, and increase their profits. Participation in cooperative marketing also improves access to transportation, storage facilities, and financial support, which further enhances income generation.

Similarly, participation in cooperative societies strengthens collective bargaining power and creates better opportunities for rice farmers to sell their produce at profitable prices. Increased income from rice farming enables farmers to meet household needs, support education, invest in healthcare, and improve their standard of living. Participatory Theory therefore explains that collective involvement in market activities contributes significantly to economic empowerment and socio-economic wellbeing among rice farmers.

Despite its usefulness, Participatory Theory has some criticisms. The theory assumes equal participation among farmers, whereas factors such as poverty, education, gender, and social status may limit some farmers from accessing market opportunities. Challenges such as poor road networks, unstable market prices, inadequate storage facilities, and limited government support may also reduce the benefits of market participation. Nevertheless, Participatory Theory remains relevant in explaining the relationship between availability of markets and income generation among rice farmers in Cross River and Ebonyi States. The theory emphasizes that active participation, cooperation, and market involvement improve farmers' income and socio-economic wellbeing.

Methodology

This study adopted a mixed-methods research design, combining quantitative and qualitative approaches to provide a comprehensive understanding of the relationship between availability of rice markets and income generation among farmers in Cross River and Ebonyi States, Nigeria. The quantitative component generated numerical data through structured questionnaires, while the qualitative component utilized Key Informant Interviews (KIIs) to obtain in-depth information on farmers' experiences, perceptions, and challenges relating to rice production, market accessibility, and income generation.

The study was conducted in Cross River Central Senatorial District (Abi, Yakurr, Obubra, and Ikom Local Government Areas) and Ebonyi North Senatorial District (Abakaliki, Ebonyi, Izzi, and Ohaukwu Local Government Areas). These areas were purposively selected because of their prominence in rice production and marketing activities.

The study population comprised rice farmers in the selected local government areas. Based on population estimates from the United Nations Department of Economic and Social Affairs (2024), the study area had an estimated population of 2,157,857 persons. Using the Taro Yamane (1967) formula for sample size determination at a 0.05 level of significance, a minimum sample size of 400 respondents was obtained. To improve representativeness, statistical precision, and reliability of findings across the wide geographical coverage of the study area, the sample size was increased to 800 respondents.

A multi-stage sampling procedure involving purposive, simple random, and systematic sampling techniques was adopted. At the first stage, Cross River State and Ebonyi State were purposively selected. At the second stage, Cross River Central and Ebonyi North Senatorial Districts were purposively selected due to their concentration of rice farming activities. At the third stage, four rice-producing Local Government Areas were selected from each senatorial district. At the fourth stage, three rice-producing communities were randomly selected from each Local Government Area. Finally, systematic sampling was employed to select individual rice farmers from the sampled communities. The sample was equally distributed between the two senatorial districts, with 400 respondents drawn from each district.

Data were collected from both primary and secondary sources. Primary data were obtained through structured questionnaires and Key Informant Interviews, while secondary data were sourced from scholarly journals, textbooks, government publications, and relevant online materials. Quantitative data were analysed using descriptive and inferential statistics, while qualitative data obtained from interviews were analysed thematically to complement and explain the quantitative findings. The hypothesis was analyzed with Pearson product moment correlation coefficient. The hypothesis was tested at 0.05 level of significance. The formula is presented as follows:

$$1 = \frac{N\sum XY - \sum X \sum Y}{(N\sum X^2 - (\sum XY)^2 (N\sum Y^2 (\sum Y)^2}$$

Where:

r	=	Co-efficient of the correlation
y	=	Dependent variable
x	=	Independent variable

$\sum$ = Summation

Analysis and Discussion

Data presented below presents the responses obtained from the field survey. The table specifically examined respondents' views on availability of rice markets and income generation. Findings from item 1 showed that 335 respondents strongly agreed and 330 agreed that farmers earn more profits when they have direct access to organized rice markets, while 70 respondents disagreed and 65 strongly disagreed. This suggests that organized market access significantly improves farmers' income and profitability.

On item 2, 334 respondents strongly agreed and 321 agreed that they generate better income whenever buyers come directly to their communities to purchase rice produce, whereas 66 respondents disagreed and 79 strongly disagreed. This indicates that a large proportion of respondents believe that direct access to buyers enhances income generation by reducing marketing constraints and improving price realization. Responses on item 3 indicated that 343 respondents strongly agreed and 335 agreed that the absence of reliable rice markets reduces farmers' ability to sell rice at profitable prices, while 57 respondents disagreed and 65 strongly disagreed. This implies that lack of stable and reliable markets negatively affects farmers' profitability and limits their ability to obtain fair prices for their produce.

On item 4, 319 respondents strongly agreed and 350 agreed that poor market structures negatively affect the economic wellbeing of rice farmers, whereas 51 respondents disagreed and 80 strongly disagreed. This finding demonstrates that inadequate market structures constitute a major constraint affecting farmers' socio-economic wellbeing and overall livelihood stability. Item 5 revealed that 349 respondents strongly agreed and 327 agreed that lack of accessible rice markets contributes to low income among rice farmers, while 73 respondents disagreed and 51 strongly disagreed. This implies that market accessibility is a critical determinant of income levels among rice farmers, as limited access to markets reduces earning potential and economic advancement.

Furthermore, item 6 showed that 339 respondents strongly agreed and 321 agreed that the availability of cooperative marketing systems improves farmers' bargaining power and income generation, whereas 79 respondents disagreed and 61 strongly disagreed. This finding suggests that cooperative marketing systems strengthen farmers' bargaining power, reduce exploitation by middlemen, and enhance income generation.

Table 1: Responses from field survey (N=800)

S/N	ITEMS	SA	A	D	SD
1	Farmers earn more profits when they have direct access to organized rice markets	335	330	70	65
2	I generate better income whenever buyers come directly to my community to purchase rice produce	334	321	66	79
3	The absence of reliable rice markets reduces farmers' ability to sell rice at profitable prices.	343	335	57	65
4	Poor market structures negatively affect the economic wellbeing of rice farmers	319	350	51	80
5	Lack of accessible rice markets contributes to low income among rice farmers	349	327	73	51
6	The availability of cooperative marketing systems improves farmers' bargaining power and income generation	339	321	79	61

Source: Fieldwork, 2026

Analysis:

Hypothesis One

Null Hypothesis (H_{01}): Availability of rice markets does not significantly relate with increase in income generation among farmers in Cross River and Ebonyi States.

The independent variable is availability of rice markets (x), while the dependent variable is increase in income generation among farmers (y). Data generated from questionnaire items 7. 1–6 were computed and paired accordingly. The summarized data were analyzed using Pearson Product Moment Correlation Coefficient. The result is presented in Table 2.

Table 2: Pearson Product Moment Correlation Analysis of Availability of Rice Markets and Increase in Income Generation among Farmers (N = 800)

Variables	**$\sum x$** **$\sum y$**	**$\sum x^2$** **$\sum y^2$**	**$\sum xy$**	**r-cal**
Availability of rice market (x)	2019	684510	687420	0.974
Increase in income generation (y)	1986	671840		

Significance at 0.05, df = 798, critical r = 0.062

The calculated r-value (0.974) is greater than the critical r-value (0.062). Therefore, the null hypothesis is rejected in favour of the alternate hypothesis. This implies that there is a strong positive significant relationship between availability of rice markets and increase in income generation among farmers in Cross River and Ebonyi States. The finding further indicates that access to organized rice markets, cooperative marketing systems, and direct access to buyers significantly improve farmers' income and economic wellbeing.

Discussion

From the hypothesis, the calculated r-value (0.974) was greater than the critical r-value (0.062). This implies that there is a strong positive significant relationship between availability of rice markets and increase in income generation among farmers in Cross River and Ebonyi States. The finding further indicates that access to organized rice markets, cooperative marketing systems, and direct access to buyers significantly improve farmers' income and economic wellbeing.

This finding aligns with the postulation of Ukwuaba, Ibe, Onyekwe, Adebayo, Bamijoko, Ukwuaba and Asogwa (2025), they observed that rice farmers with greater access to structured markets including cooperative marketing centers and urban buyer networks, experienced significantly higher incomes compared to farmers restricted to small local markets. Their analysis showed that proximity to organized sales outlets, frequency of market participation, and presence of multiple buyers were significant predictors of higher cash returns, illustrating how market availability directly affects income. Ibrahim, Barau and Abdullah (2025), added that Nigerian rice farmers with stronger linkages to formal and informal markets achieved greater income diversification and higher total farm revenue due to increased sales volumes and better price realization. Access to competitive buyers and transparent pricing enabled farmers to negotiate better terms, reduce exploitation by middlemen, and realize higher net income. Ezeudu and Obimbua (2024) reinforced this view, highlighting that rice farm households engaged in peri-urban and regional markets achieved higher income than those limited to rural village sales because they could capture a larger share of the value chain. Historical evidence also supports the relationship between market participation and income generation. For example, Ogunleye (2018) found high levels of output market engagement (mean participation of 89%) among rice farmers in Ogun State, and that determinants such as farm size, education, fertilizer use, and transport costs significantly influenced participation which is a necessary precursor to income generation through market sales (Ogunleye, 2018).

The in-depth interview findings also supported the findings and assertion above, for example: A village head from Obubra LGA, explained that access to buyers from nearby towns has improved farmers' income levels. He added that when markets are available, farmers are encouraged to cultivate more because they are assured of selling their produce. However, he highlighted the challenge of unstable prices caused by middlemen who often exploit farmers during harvest periods.

Youth leader from Yakurr LGA, revealed that the absence of standard rice markets sometimes forces farmers to sell at very low prices immediately after harvest. He added that when buyers come directly to the community, farmers earn better income, but poor road conditions and lack of storage facilities limit access to wider markets. Farmers' association president from Abi LGA, stated that farmers generate more income when they have direct access to urban markets. According to him, the presence of rice processors and cooperative buyers has improved the financial well-being of some farmers within the community.

Market leader from Ikom LGA, explained that access to reliable buyers improves farmers' income and motivates greater investment in farming activities. However, he noted that poor market structures and unstable prices continue to negatively affect rice farmers. Another village head from Ebonyi LGA, recorded that farmers benefit significantly when markets are accessible and prices are stable. He argued that an organized market system would enhance farmers' income and reduce exploitation by middlemen.

A youth leader from Izzi LGA, pointed out that poor road networks and transportation challenges limit farmers' access to profitable markets. He stated that many farmers are forced to sell within their villages at lower prices due to difficulty in transporting rice to urban centers. Farmers' association leader from Ohaukwu LGA, observed that cooperative societies play a key role in helping farmers secure buyers. He added that improved market access also encourages farmers to expand production because of expected higher returns.

A market leader explained from Abakaliki LGA, explained that the absence of stable markets negatively affects farmers' income. He noted that farmers often suffer losses when buyers refuse to offer reasonable prices for rice produce. A staff from ministry of agriculture Ebonyi State, stated that farmers make better profits when there is easy access to rice buyers and processing centers. He emphasized that the lack of organized markets continues to affect many rural farmers adversely.

Another staff from ministry of agriculture Cross River State, observed that reliable rice markets increase farmers' income and encourage continuous production. However, he noted that poor market structures and unstable prices remain major challenges facing rice farmers in both Cross River and Ebonyi States.

Conclusion

This study investigated availability of markets and income generation of farmers in Cross River and Ebonyi States, Nigeria. The study was necessitated by the growing importance of rice production as a major agricultural enterprise capable of improving rural livelihoods, reducing poverty, and enhancing household welfare in agrarian communities. The findings from the field survey and key informant interviews established that availability of rice markets significantly relates to increased income generation among farmers. Access to organized and reliable rice markets enables farmers to sell produce at profitable prices, improves bargaining opportunities, and strengthens economic returns. However, poor market infrastructure, unstable prices, and the activities of exploitative middlemen were identified as constraints limiting income maximization among farmers. The hypotheses tested using Pearson Product Moment Correlation Coefficient confirmed statistically significant relationships between availability of markets and income generation. This validates the assertion that availability of markets plays a critical role in shaping the income generation of farmers in Cross River and Ebonyi States. The findings support the assumptions of sustainable livelihood theory and participatory theory which collectively explain how availability of markets promote income generation. In conclusion, available of markets remains a vital instrument for income generation among rural households in Cross River and Ebonyi States. Its potential to improve food security, promote better healthcare, and enhance living standards is evident.

Recommendations

1. Government should establish organized rice marketing structures and improve rural market infrastructure to enhance farmers' income generation capacity: The findings showed that availability of rice markets significantly improves income generation among farmers. Therefore, state governments in Cross River and Ebonyi should invest in modern market facilities, storage systems, feeder roads, and transportation networks that connect farming communities to urban markets.
2. Farmers' cooperative societies should also be strengthened through financial support and institutional backing to improve collective bargaining power, eliminate exploitation by middlemen, and provide timely access to market information. This will ensure fair pricing, reduce post-harvest losses, and significantly improve farmers' economic wellbeing.

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