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Determinants of Youth Participation in Rice Cultivation in South-Eastern Nigeria

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Abstract

The study assessed youth participation in rice cultivation in South Eastern Nigeria. It ascertained the rice varieties cultivated by the youth, determined the extent of utilization of rice cultivation technologies, described respondents' challenges in rice cultivation, examined the determinants of youth participation in rice cultivation and determinants of the extent of utilization of improved rice cultivation technologies. Multi-stage sampling procedure was used in selecting 312 respondents for the study. Data were collected with a structured questionnaire and analysed using mean scores, percentages, and regression analysis. The respondents cultivated FARO 44 (84.6%), practiced early planting ($\bar{x}$ =2.9), timely harvesting ($\bar{x}$ =2.6), and cultivated improved varieties ($\bar{x}$ =2.7) as utilised rice improved technologies. The major challenges of youth participation in rice cultivation were inadequate agricultural credit (89.4%) and poor access to improved seeds (86.7%) among others. Age (β=-0.214), education (β=0.212), and access to credit (β=-0.4311) were the determinants of youth participation while internet access (β=1.271), access to extension services (β=2.144) and hours spent on the internet (β=2.142) determined their extent of utilization of technologies. Socio-economic factors and the challenges faced influenced youth participation in rice cultivation. The government and nongovernmental agencies should increase youth access to agricultural digital tools, improve seeds and internet penetration in rural areas

Introduction

It is estimated that by 2050, the world population will be above 9.8 billion. This projection poses a severe threat to food production to meet the distressing population increase, which creates a growing apprehension between food supply and demand (Talaviya et al., 2020). The World Bank has reported that from 2021 to 2030, the youthful population of Africa will account for 11-15% of the growth in Gross Domestic Product (GDP). The 2020 National Bureau for Statistics (NBS) puts the total population of Nigerian youths aged (15-35) years at 95,315,144 million with 78.8 percent of them living in the rural areas and 52.6 percent employed in the agricultural sector (NBS, 2021). This implies that Nigeria boasts of more youths when compared to other segments of the population and there are unique socio-economic significances of this. Rural youth livelihood in Nigeria is insecure given that they are susceptible to alterations in agrarian relations and processes of economic development. This is evident in sustained economic insecurity, unpredictable livelihood indicators and unemployment due to scarce job opportunities. The fact that the majority of the youthful population of Nigerians are resourceful with great capacities could be used to transform the agricultural sector as they live in rural communities (Betcherman et al., 2020). However, studies (Mba et al., 2021; Attamah et al., 2023; Geza et al., 2021) have shown that youths are indifferent towards farming, which is a possible solution to rural unemployment because farming is perceived to be non-lucrative in Nigeria. Youth participation in agriculture is the effective involvement and impact of young people in the agricultural sector. This active involvement does not only focus on their passive presence but rather on qualities that relate to having a tangible influence on issues that concern them. The core assumption of youth participation in agriculture is that young competent individuals are not passive recipients of services and are involved in livelihood decision-making. (Geza et al., 2021).

Rice cultivation provides several entrepreneurial opportunities for youth in rural areas. However, the use of crude implements has been identified as a major constraint to rice cultivation in Nigeria (Mba et al., 2021). This implies that rice production is carried out through physical strength which degenerates as farmers grow older. This has

given rise to the aging population of rice farmers making it vital for youths to participate in rice production to close the demand-supply gap in rice production in Nigeria (Alabi et al., 2024). The non-recognition of the need to provide an enabling environment for youth participation in rice cultivation may be attributed to the absence of adequate information on the factors that influence youth participation in agriculture.

Rice production is regarded as the fulcrum for economic development in Nigeria given that it can facilitate wealth creation through the provision of employment opportunities, ensure food security, provide social stability as well as minimize economic migration from Nigeria. These capacities have however remained unattained notwithstanding several agricultural programmes in Nigeria such as the Agricultural Transformation Agenda (ATA), ANCHOR Borrowers among others target the attainment of self-sufficiency in rice production (Arouna et al., 2021). Currently, rice consumption ranks third on the list of most important food commodities in Nigeria (Izuogu et al., 2023b). However, Olanrewaju et al. (2021) reported that Nigeria is the largest producer of rice in West Africa, it is also the highest importer of the commodity in Africa. Rice importation increased by 4 percent in 2023 as total year import rose from 2.3 in 2022 to 2.4 in 2023 while the area harvested decreased from 3.6 to 3.5 hectares. This was a result of the reduction in domestic production due to an increase in cases of flooding, insecurity, inadequate mechanization, low household purchasing power, high cost of production, and climate change (United States Department for Agriculture, 2023). Among the improved varieties of rice in Nigeria are FARO 44, FARO 61, FARO 60, FARO 52, and NERICA 8. Rice can be cultivated on irrigated land, rain-fed lowland, upland and deep-water (Izuogu et al., 2023b).

Farmers in South-eastern Nigeria are actively involved in rice cultivation as it is cultivated in almost all the states in the region with a production capacity of about 720 metric tons (Izuogu et al., 2023b). This study therefore attempted to assess the determinants of youth participation in rice cultivation to improve rice production and reduce rural-urban migration among youths. Specifically, the study;

- identified respondents' preference in terms of rice variety for cultivation,
- determined their extent of utilization of available rice cultivation technologies,
- assessed their challenges in participating in rice cultivation

Hypotheses:

- There is no significant influence between the Youths' socioeconomic characteristics and youth participation in rice cultivation.
- There is no significant influence in youths' socio-economic-characteristics and their extent of utilization of rice production technologies

Methodology

The study was conducted in the south-eastern zone of Nigeria. The zone comprises five states Abia, Anambra, Ebonyi, Enugu, and Imo. It is situated within latitudes 04°17' N and 07°06' N and longitudes 05°23' E and 09°28' E. The 2020 National Bureau for Statistics (NBS, 2020) population estimate for the region is 22, 005, 828 persons. Farming is the main occupation for rural dwellers in the zone.

Data were collected using a multi-stage stratified random sampling procedure within a cross-section of youth in the rural area who are engaged in rice cultivation. In the first level, three states (Abia, Anambra, and Ebonyi) were purposively selected given their active involvement in rice cultivation (Izuogu et al., 2023b). The second stage involved the selection of 50% of Local Government Areas (L.G. As) with the largest population of youth engaged in rice cultivation to give about 10 L.G. As (Abia (2),

Ebonyi (5), Anambra (3). The list of local government areas that engaged in rice cultivation was obtained from state Agricultural Development Programme (ADP) offices. In the third stage, with all the local government areas participating in the 3 states, 25% of communities with the highest youth engagement in rice cultivation were selected from two local government areas from Abia state, five local government areas from Ebonyi state and, three local government areas from Anambra state to give a total of about 18 communities (3 from Abia, 9 from Ebonyi and 6 from Anambra). The fourth stage was the selection of 20% of young rice farmers from each of the communities which resulted in 328 participants for the study. Only responses from 312 respondents were used for the study which implied a 95.12% success rate.

Data were collected using structured questionnaires under the administration of trained research assistants. Approval was secured from the participants before they filled out the questionnaires. Participants were advised in clear terms not to participate in the research if they had misgivings over the study and to withdraw without giving prior consent at any period in the survey. The purpose of the study was appropriately conveyed to the respondents as well as the need for them to provide correct information.

Youth participation in rice cultivation was measured on a nominal level (Yes = (1), No= (1). Data on the extent of utilization of technology was collected using a Likert-type scale of Very great extent = (5), Great extent = (4), Moderate extent=3, Low extent=2, Very low extent=1. The scores were summed up for a total of 15 which was divided by 5 to get a mean score of 3.0. Mean scores of 3.0 and above represented a high extent while below 3.0 represented a low extent. Other variables were measured accordingly

Results and Discussions

Rice Varieties Cultivated

Table 1 indicates that the most cultivated varieties by the youth were FARO 44 (84.6%), MAS 11 (76.4%), ITA 306 (72.3%), and FARO 60 (64.4%). This finding implies that the respondents cultivated various improved varieties of rice. The findings are in agreement with Izuogu et al. (2023b) that farmers prefer FARO 44, MAS 11, and FARO 60 varieties; while FARO 44 is preferred for its early maturing and increased yield advantage, MAS 11 is preferred because of its taste, long grain, and yield (Mba et al., 2021).

Youth that participates in rice cultivation will be favourably disposed to varieties that support increased harvest in a planting season while guaranteeing such market advantages as higher yield and taste. This will facilitate more income from rice cultivation for them.

Table 1: Rice varieties cultivated

Variables	Percentage
FARO 44	84.6
MAS 11	76.4
ITA 306	72.3
NERICA 8	67.7
FARO 60	64.4
Gina	58.1
Volume 15	49.8
FARO 52	45.4

Source: Field survey

Extent of Utilization of Available Improved Rice Production Technologies

Table 2 reveals that early planting ($\bar{x}$ =2.9), cultivation of improved varieties ($\bar{x}$ =2.7), timely harvesting ($\bar{x}$ =2.6), and regular weeding ($\bar{x}$ =2.6) were the major improved rice cultivation technologies implemented by the respondents. This implies that rice production technologies were available for the respondents who utilized them in their cultivation activities.

This result agrees with that of Onyeneke et al. (2021) that with the increase in alterations in climatic variables, rice farmers implement early planting and timely harvesting as adaptation strategies against climate change. Mba et al. (2021) reported that early planting influences yield and grain quality in rice cultivation as rice planted after the ideal planting period displayed decreased yield. Timely rice cultivation will raise rice productivity by mitigating the challenges of reduction in yield which is often attributed to forcing the growth period of the crop into seasons of extreme climatic conditions (Abdulrazaq et al., 2023; Agou et al., 2024). It also increases the efficiency of resource utilization while permitting the cultivation of more rice per cropping season on the same land. This comes with optimal profit maximization for rural youths engaged in rice cultivation and the attendant gain will be used to either expand their production or ploughed into other non-farm livelihood activities. When rice is planted early, there is an increased likelihood of early pollination. Improved rice varieties reduce the vulnerability of the rice farm to such challenges as pest infestations, drought, flood, and reduction in yield thereby boosting the productive capacity of rice farms. Although early maturing rice varieties come with an unexpected challenge of harvesting, especially during the rainy seasons as rice farmers would need to drain the water before harvesting, timely harvesting of rice reduces the growth period of rice on the field thereby demanding lesser inputs such as fertilizer, weedicides, and labour (Izuogu et al., 2023b).

Table 2: Extent of utilization of available improved rice production technologies

Variables	$\bar{x}$	SD
Early planting	2.9	0.9
Cultivation of improved varieties	2.7	0.7
Timely harvesting	2.6	0.6
Regular weeding	2.6	1.6
Integrated pest management	2.4	0.8
Keeping farm records	2.2	1.1
Preparation of seed	2.1	0.8
Ideal seed rate	2.1	0.8
Post nursey planting	1.9	0.7
Thinning /supplying	1.8	0.5
Seed germination testing	1.6	1.0
Rice nursey technique	1.3	0.8
Appropriate spacing	0.9	0.7
Minimum land tillage	0.7	0.5
Soil assessment	0.5	1.3
Use of organic manure	0.5	0.7
Use of urea fertilizer	0.4	1.4

Source: Field survey

Determinants of Youth Participation

Results in Table 3 show that sex (β=-2.324), household size (β=0.363), and distance to the farm (β=0.032) were not significant in determining the likelihood of youth participation in agriculture in the study. However, age (β=-0.214) had a negative and statistically significant association with youth participation in rice cultivation. Essentially, the older the youths grow, the more the likelihood of not participating in rice cultivation. Izuogu et al. (2023b) suggested this could be attributed to the use of crude implements in rice cultivation. For instance, many farmers do not have access to tractors for soil preparation and the high cost of weedicides compels farmers to engage in manual weeding. These activities require exertion of physical energy which may be difficult as young people advance in their age.

There was a positive significant relationship between education (β=0.212) and youth participation in rice cultivation. This agrees with Abdulrazaq et al. (2023) who reported that the more educated youths are, the more the likelihood of their participating in agriculture. Educated farmers are usually more successful hence they serve as role models for youths. The more educated youth are, the more likely they will possess better decision-making skills and approaches to farm management.

Among the variables that played an active role in youths' participation in rice cultivation is access to credit (β=-0.431). Against a priori expectation, access to credit had a negative and statistically significant relationship with youth participation in rice cultivation. Youths in rural areas usually engage in rice production as a source of livelihood given the scarcity of non-farm occupations in the rural areas. Poor monitoring of credit facilities may encourage youths to utilize agricultural credits for other off-farm activities that seem more attractive than farming.

Cooperative membership significantly positively affects the probability of youth participation in rice cultivation. This agrees with Abdulrazaq et al. (2023) who observed that social networking among rural youths can give rise to favourable attitudes to rice cultivation. Also, joining a cooperative association could facilitate certain opportunities for the youths which would be very difficult for them to access as individual farmers. For instance, land ownership is perceived as an adult privilege**.** FAO (2019) observed that customs and laws relating to land inheritance in developing countries often make the transfer of land to young women very difficult and South Eastern Nigeria is not exempted from this. More so, given the communal land tenure system that is practiced in most states in the study area, access to land would pose a severe barrier to young farmers who intend to participate in rice cultivation as they are expected to grow to adulthood before they can own land, but membership of co-operative associations could provide youth with platforms that guarantee them the possibility to secure land for rice cultivation.

Ownership of mobile phones (β=-0.102) has a significant negative influence on youth participation in rice cultivation. This negates the findings of Quandt et al. (2020) that ownership of phones has significant positive influence on participation in agriculture. Rice cultivation among youths in rural areas serves as a source of income. It's possible that the youths did not utilize their mobile phones in accessing rice cultivation assistance. This might be due to the fact that mobile phones avail youths of several other trending sources of income, even though some of these avenues are not sustainable such as cryptocurrency. Given that these sources require less exertion of strength and seem more 'dignifying', ownership of mobile phones may discourage participation in rice cultivation.

Regarding the perception of the utilization of digital tools (β=0.523) in rice cultivation, youth who had positive perceptions were more likely to engage in rice cultivation. Utilization of digital tools in agriculture according to Izuogu et al. (2023a) reduces drudgery. Olagunju et al. (2021) suggested that increased utilization of digital tools in agriculture will attract more youths to farming. Some of the digital tools utilized in rice cultivation include the RiceAdvice App, mobile rice husk gasifiers, zero-waste pig biogas, Mycrop, and drones. Digital tools are prevalent in different spheres of youthful life including those in the rural areas and can easily be adopted in rice cultivation by youth without much stress.

Table 3: Determinants of youth participation

Variables	Coefficient
Age	-0.214***
Sex	-2.324
Education	0.212***
Household size	0.363
Access to credit	-0.431**
Cooperative membership	2.342***
Access to extension	1.432***
Ownership of mobile phone	-0.102***
Distance to farm	0.032
Perception of use of digital tools in rice cultivation	0.523***

Source: Field survey *** P≤0.01. ** P≤0.05

Determinants of Extent of Utilization of Available Improved Rice Production Technologies

Age had a negative significant relationship (β=-2.012) with the extent of utilization of rice cultivation technologies. Older people are known to be more conservative hence they show negative attitudes toward the adoption of production technologies. Younger farmers who may be more open to trying new technologies in rice cultivation may change their attitude as they grow old.

There was a significant positive relationship between access to Internet service (β=1.271), the number of hours spent by youth on the Internet with the extent of utilization of rice cultivation technologies among youths who are already cultivating rice. The internet has provided a paradigm shift in rural communication. Youth who surf the internet often are likely to come across positive results from other farms with increased utilization of rice cultivation technologies. If youths are familiar with the rice cultivation technologies utilized, they will easily understand their comparative advantages. This will mitigate their fears towards these technologies and also motivate them to increase their extent of utilization of rice cultivation technologies. Also, internet access can increase the ability of youth to bargain for agricultural inputs, support the expansion of their agricultural market, and improve production performance. Access to credit (β=0.114) positively influenced the extent of utilization of improved technologies by youth who are engaged in rice cultivation. This implies that the more youths had access to credits, the more the likelihood of their involvement in rice cultivation. Rice cultivation in South-Eastern Nigeria relies mainly on natural environmental conditions such as rainfall, temperature deviations, and variability in prices arising from unstable market conditions. Changes in the climatic variables are

the biggest source of risk in rice cultivation as they also affect economic viability (Mba et al., 2021; Munonye et al. 2022). Access to credit will permit young people who cultivate rice to be well-positioned for risk management as adequate credit can serve as a buffer to cushion the effect of failure that might result from the adoption of improved technologies in rice cultivation. Moreover, credit could assist youths in cultivating more for enhanced income and other benefits from rice production.

Table 4: Determinants of the extent of utilization of available improved rice cultivation technologies

Variables	Coefficient
Age	-2.012**
Farm size	1.212
Farming experience	0.231
Access to internet	1.271***
Access to credit	0.114***
Cooperative membership	1.109
Access to extension services	2.144**
Number of hours spent on the internet	2.142***

Source: Field survey *** P≤0.01. ** P≤0.05

Constraints to Participation in Rice Cultivation.

According to results in Table 5, Inadequate agricultural credits (89.7%), poor access to improved seed varieties (86.4%), lack of digital tools for rice cultivation (84.3%), and high cost of agricultural inputs (78.7%) were the major constraints to youth participation in rice cultivation. The result also reveals that youths are facing such challenges as the high cost of inputs, limited access to agricultural land, unfavourable disposition towards farming among others.

Attamah et al. (2023) and Munonye et al. (2023) reported that lack of capital and poor access to agricultural credits posed challenges to youth participation in rice production in the Bende Local Government Area of Abia State. Hence, insufficient capital will retard the ability of youth involved in rice cultivation for accessing improved seed varieties, labour as well as the adoption of various production practices that target increased productivity.

Izuogu et al (2023a) identified a low level of digitalization as a major challenge to agriculture in Nigeria. Farmers rely much on indigenous technology to predict production outcomes. Olagunju et al. (2021) lamented that adequate attention has not been paid to digitalization in Nigeria as a result of poor knowledge of its abilities to control production risks in farming.

The challenges posed by the lack of access to improved seeds (86.4%) are worrisome. Cultivation of improved seeds has been reported to eradicate some of the challenges associated with farmer's seeds which retard agricultural productive capacity. Such challenges include susceptibility to pests and diseases, low output, vulnerability to drought, flooding, and other variables that constitute climate change (Izuogu et al., 2023b).

Table 5: Constraints to participation in rice cultivation.

Variables	Percentage
Inadequate agricultural credits	89.7
Poor access to improved seed varieties	86.4
Lack of rice cultivation of digital tools	84.3
High cost of agricultural inputs	78.7
Limited access to farmland	76.0
Unfavourable disposition towards farming	72.4
Lack of adequate knowledge in rice farming	47.3
High labour cost	45.7
Absence of government support	42.2
Climate change	32.7
Pest and disease infestations	29.3

Source: Field survey

Conclusion and Recommendations

The study reveals that FARO 44 and MAS 11 were the major rice varieties cultivated by youths using early planting, cultivation of improved varieties and timely harvesting production technologies by the youth. Youth participation in rice cultivation was influenced by their perception of the digital tools' utilisation in rice cultivation, access to credit, membership in cooperative societies, and ownership of phones. However, access to the Internet, the number of hours spent on the Internet and access to credit influenced the extent of their utilization of available technologies. Youth participation in rice production was limited by insufficient capital, lack of access to improved seed varieties, low utilization of digital tools, and high cost of agricultural inputs.

The study recommends that efforts should be made by the government and other agricultural development partners to ensure that digital tools are available and accessible to youth for rice cultivation. Internet facilities in rural areas should be improved by telecommunication companies to onboard more youths as this will increase their extent of utilization of improved technologies in rice cultivation. Agricultural credits and improved seeds should be adequately provided for the youths.

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