Rice Farmers' Perception and Willingness to Pay for Agricultural Insurance in Anambra State, Nigeria

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Abstract

The study assessed rice farmers' perception and willingness to pay for agricultural insurance in Anambra State. It ascertained respondents' awareness of agricultural insurance, subscription to insurance policy, perception of agricultural insurance, and their willingness to pay for insurance policy. Multi-stage sampling procedure was used to select one hundred and forty-eight rice farmers for the study. Data were collected with a structured questionnaire and analysed with percentages, mean scores, and Probit regression analysis. The majority of the respondents are aware of agricultural insurance but 87.6% of the respondents did not subscribe to insurance policy even with their favourable perception of agricultural insurance ($\bar{x}$=2.6) and their willingness to pay for it ($\bar{x}$=2.7). Age (β=-1.832), cooperative membership (β=0.250), previous experience with agricultural risk (β=1.106), cost of the premium (-0.114), and debt amount (β=-2.115) significantly influence rice farmers willingness to pay for an insurance policy. Rice farmers' have a favourable perception of agricultural insurance and are willing to pay for it. The government should subsidize insurance premiums for farmers

Keywords: *Agricultural insurance awareness, willingness to pay, agricultural risk.*

Introduction

Agricultural production will remain the center of livelihood as long as life exists on earth. The sector serves as the beacon for enhancing food security, national income, employment generation, poverty alleviation, foreign exchange, and an avenue for sustainable environmental management among others (Cennet and Siti, 2021). Several sectors rely on the agricultural sector as the source of their production inputs hence given the vital role agriculture plays in national development, its growth is expected to be essential for poverty alleviation, especially in developing countries.

In Nigeria, the contribution of agriculture to the Gross Domestic Product (GDP) was 24.17% in 2023 however, the majority of the farmers in Nigeria are living below the poverty line (Ohaturuonye *et al*., 2022). This has been attributed to several reasons including the prevalence of risk arising from the detrimental effects of natural and climate threats due to rainfall variations, droughts, flooding, and such biological hazards as the outbreak of pests and diseases which results in crop failure and food insecurity (Ali *et al*., 2021). The World Bank reports that Nigeria is exposed to floods, and other climate change-related risks and ranked as 160th position out of 181 countries in the 2020 Notre Dame Global Adaptation Initiative index

(ND-GAIN) (Climate Risk Profile, 2021).

This is because the country is challenged by many environmental issues that have been worsened by climate change with the attendant negative influence on food production, water management, and infrastructure (Mbah *et al*., 2021).

Aside from climate-related risk, agricultural production is also vulnerable to challenges from government policies, and post-harvest losses which negatively influence the ability of the farmer to break even. Cennet and Siti (2021) identified agricultural risks to include production-related risks, marketing-induced risks, credit facility risks, and individual and environmental risks. These can give rise to adverse results such as reduction in yield and income, bankruptcy, and other indices of poor standard of living among farming households. The negative outcome of these disasters can affect the entire value chain with a reduction in industrial production. The crop sector is usually most affected by floods, storms, pests and diseases which negatively impact the quality and quantity of agricultural products. Rice cultivation is vulnerable to failure as a result of multiple risks such as natural disasters arising from drought, flooding, fluctuations in temperature and humidity and attacks from pests and diseases. Mitigation approaches such as agricultural insurance is essential to reduce the effects of these risk (Ifenkwe and Izuogu, 2015).

Nigeria is the highest producer of rice in the West African region. The total land area under rice cultivation is about 3.5 million hectares which produced about 5.58 million metric tons in 2023 (United States Department of Agriculture-USDA, 2024). There have been reports of increased consumption of rice due to changes in household world preference towards rice, growth in household income, and development of more urban centres. Rice cultivation in Nigeria is characterised by a low yield of about 2.2 t/ha when compared to 3.2 t/ha from research plots (Mba *et al.*, 2021). Also, the sector is vulnerable to several production risks that negatively influence agricultural production in Nigeria.

Cennet and Siti (2021) reported the need to institute policies to consolidate the ability of the agricultural sector to withstand risk and boost investment for food sufficiency as well as shield farmers who face adverse production conditions. To this end, agricultural insurance strategy has been identified all over the world as a viable approach to risk management (Ngango *et al.*, 2022). Agricultural insurance shifts the adverse effect of risk from the farmers to others through the payment of premiums to insurance companies which represents the cost of risk transfer (Ifenkwe and Izuogu, 2015). The Nigerian government identified the importance of providing reliable assistance for agricultural development that approaches the challenges of production risk and uncertainties. In view of this, the government instituted the Nigerian Agricultural Insurance Scheme (NAIS) under the management of the Nigerian Agricultural Insurance Corporation (NAIC). The main objective of this is to reduce the destructive outcomes of agricultural risks and guarantee suitable compensation to sustain production (Okpukpara *et al*., 2021).

Ngango *et al*. (2022) admitted that the absence of primary knowledge of agricultural insurance, challenges in securing climate–related messages, costly insurance premiums, etc are among the major issues responsible for low subscription to insurance policies by farmers in the sub-Saharan region. In addition to these, poor access to credit facilities also deters crop farmers from obtaining insurance policies as banks and other financial agencies in Nigeria perceive the agricultural sector to be precarious. Rice farmers are expected to subscribe to insurance policies to protect their farm investment against risk and ensure sustainability in their production activities. Given this, empirical research must be conducted to ascertain rice farmers' perception and their willingness to subscribe to an insurance policy. The reports from the study will provide a clearer understanding of rice farmers' perception of agricultural insurance and assist the actors in the insurance sector in finding solutions to the low level of insurance uptake by farmers.

Anambra State is one of the major producers of rice in South Eastern Nigeria. However, rice output in the state is lower than

2.1 metric tons per hectare with a negative yield difference of about 14% when compared to the West African average (Mba *et al*., 2021). A lot of issues have been blamed for this including the challenges arising from the adverse effects of climate change, inconsistent government policies, insufficient extension service contact, etc. Several farming communities suffered losses during the rainy periods between 2019 – 2023 with their rice farms completely submerged (Izuogu and Ekumankama, 2015). This destroyed farmlands and produced critical damage to crops as it occurred during the onset of the rice harvest period in Anambra and neighbouring states (Elum and Enemali, 2023). Despite these challenges, there are no recent studies on rice farmers' perception and willingness to pay for agricultural insurance in the state. This study, therefore:

i. Ascertained the respondents' awareness of the agricultural insurance scheme,
ii. Profiled their sources of information on agricultural insurance,
iii. Identified their ownership of insurance policy cover,
iv. Described their perception of agricultural insurance, and
v. Determined their willingness to pay for agricultural insurance policies

Hypothesis of the study

The study hypothesis analysed the relationship between respondents' socio-demographic characteristics and their willingness to pay for agricultural insurance policies.

Methodology

The study was conducted in Anambra State, Nigeria. The state lies within latitudes 5032' and 6045' N and longitudes 6043' and 7022' E. There are two distinct weather seasons in Anambra state viz- the dry and rainy seasons (Elum and Enemali, 2023). Climate change has made it difficult to predict the commencement of the different seasons. However, the dry season usually begins around October and ends towards March, while the rainy season commences by April and terminates around October. Anambra state experiences more rainfall regimes when compared to the dry season with an annual average rainfall of about 212.36 millimetres per annum, and 73.34 mean relative humidity. Rice, cassava, and cocoyam are the major agricultural products in the state. The Nigerian Agricultural Insurance Cooperation (NAIC) is among the agricultural insurance companies located in the state.

Rice farmers in Anambra state made up the population of the study. A multi-stage sampling procedure was used in selecting respondents from the four agricultural zones in the state (Awka, Onitsha, Aguata, and Anambra). In the first stage, Onitsha, Aguata, and Anambra zones were purposively selected because of the intensity of rice cultivation in the zones. The second was the selection of fifty percent of rice-producing extension blocks from each of the zones to give a total of 8 blocks (2 from Onitsha, 2 from Aguata, and 4 from Anambra). Sixty percent of rice-producing circles were selected from each of the blocks for a total of 17 circles in the third stage. The final stage comprised the random selection of forty percent of rice farmers from each of the circles for a total of 148 respondents for the study. Data were collected using a structured questionnaire which was administered by trained enumerators between December 2023- May 2024 and analysed by July 2024 with percentages, mean scores, and Probit regression analysis. Respondent's awareness of agricultural insurance scheme, sources of information on agricultural insurance, and ownership of insurance policy were measured on a nominal level (Yes =1, No =1) for each of the listed options. Perception of agricultural insurance and willingness to pay were measured on a four-point Likert-typed scale. While perception was measured as on a five-point rating scale corresponding to unacceptable (1), slightly unacceptable (2), slightly acceptable (3), and perfectly acceptable (4). Farmers' willingness was measured as not willing (1), somewhat unwilling (2), somewhat willing (3), and not willing (4). These scores were added to give a sum of 10 points which was divided by 4 for a mean score of 2.5. Respondents with a mid-point of 2.5 and above demonstrated a favorable perception while those below 2.5 demonstrated an unfavorable perception of

willingness implying very willing and not very willing respectively.

The model for the analysis of the hypothesis was specified below:

Y=BO+B1X1+B2X2+B3X3+B4X4 U……..(1)

Where: Y=1 or 0 (1=Willing to subscribe to insurance policy 0 = Not willing to subscribe to an insurance policy).

B1-B4 = Coefficient of the factors

Variables in the study were measured as

X1 = Gender (male 1, female 0)
X2 = Age (number of years)
X3 = Membership of a cooperative organization (yes 1, no 0)
X4 = Awareness of agricultural insurance scheme (yes 1, no 0)
X5 = Previous experience with agricultural risk (yes 1, no 0)
X6 = Access to credit (yes 1, no 0)
X7 = Debt amount (amount in naira)
X8 = Satisfaction with agricultural insurance information resources (yes 1, no 0)
X9 = Cost of premium (yes 1, no 0)

Results and Discussion

Sources of agricultural insurance information

Results in Table 1 reveal that radio (89.35 %), internet (78.44%), television (61.20%) and banks (59.10%) were among the major sources of information on agricultural insurance among the respondents. This agrees with the findings of Atasie and Izuogu (2015) that farmers use various sources of information to satisfy their information demands and they include mainly radios, newspapers, and televisions among others. The increased use of radio may be attributed to its capacity to reach a wider audience notwithstanding their social strata. Also, radio does not require a high level of literacy on the part of the farmers. This promotes the level of awareness of farmers and ensures that they are adequately informed. Banks are directly concerned with the implementation and supervision of agricultural insurance schemes and also serve as sources of agricultural information to farmers.

Awareness of Agricultural Insurance Scheme

The majority of the respondents are aware of an agricultural insurance scheme. Table 2 shows that 79.43% of the respondents are aware of private insurance schemes while 67.80% are aware of the government insurance schemes. This result is in agreement with Okpukpara *et al*. (2021) who reported a high level of awareness of agricultural insurance schemes among farmers in neighbouring Kogi State. Izuogu *et al*. (2015) attributed this to the availability of mass media such as radios and televisions, Olagunju *et al.* (2021) reported that increased internet penetration in rural areas has boosted farmers access to agricultural information irrespective of the dwindling roles of agricultural extension services.

Awareness influences the willingness to subscribe to agricultural insurance schemes as it implies possessing knowledge regarding agricultural insurance and its advantages (Atasie & Izuogu, 2017; Gbigbi & Ndubuokwu, 2022; Kipkemoi & Ceyhan, 2021). Despite the high level of awareness for private and public insurance schemes (79.43% and 67.80%) respectively, about 87.6% did not subscribe to any insurance policy. There are various

Table 1: Sources of agricultural insurance information

Source	Percentage
Radio	89.35
Internet	78.44
Television	61.20
Banks	59.10
Insurance policy providers	53.20
Agricultural cooperative associations	45.30
Fellow farmers	43.40
Extension service provider	34.58

Table 2: Awareness of an agricultural insurance scheme

Farmers' awareness	Percentage
Aware of private insurance schemes	79.43
Aware of government insurance scheme	67.80
Not aware of any agricultural insurance scheme	24.50

indigenous approaches to ameliorate the outcome of agricultural risk at the level of rice farmers which may include crop diversification, water-harvesting, etc. If farmers aren't aware of the availability of agricultural insurance schemes, they may likely adopt these non-monetised approaches.

Subscription to insurance policy

From Table 3, the majority (87.6%) of the respondents did not subscribe to an insurance policy policy. Only 15.3% are insurance policy holders with government agencies while 2.3% have private agency insurance policies. This implies that mahority of the rice farmers in the study area did not subscribe to insurance policy. The result agrees with Shaibu *et al*. (2020) who reported that reported that less than 5% of the farmers insured their farms. Farmers may experience great losses that may cause them to lose their farms as a result of revenue disruptions that come with risk. Also, lack of liquidity among farmers hinders the insurance policy subscription. Rice farmers' wealth provides them more access to credit and this facilitates their access to agricultural insurance.

Also, when farmers compare ensuring their rice farm farms viz-a-viz other household necessitates, they may align their intention towards taking the chances over the vulnerability of their farms while trusting their destiny that disaster will not occur.

Perception of the Agricultural Insurance Scheme

Results in Table 4 indicate that rice farmers acknowledged the need for agricultural insurance as they demonstrated a favourable perception towards it ($\bar{X}$=2.6). They agreed that smallholder farmers receive benefits from agricultural insurance ($\bar{X}$=3.1), insurance minimizes anxiety ($\bar{X}$=2.6) while disagreeing that damages and losses to rice farms are of divine providence ($\bar{X}$=2.2) and government should fully pay for farmers' losses ($\bar{X}$=1.6). The result implies that rice farmers have positive

Table 3: Subscription to insurance policy

Distribution of farmers	Percentage
Subscribed to government insurance policy	15.3
Subscribed to private insurance policy	2.3
Not having any insurance policy	87.6

Table 4: Perception of the agricultural insurance scheme

Perception	Mean	SD
It's not the government's way of taxing rice farmers	3.2	0.7
Smallholder farmers receive benefits from agricultural insurance	3.1	0.6
There is a need for insurance to ameliorate negative outcomes in rice production	2.8	1.2
When rice farms are ensured, farmers' anxiety is minimised	2.6	0.6
The insurance of rice farms is very essential for sustainable production	2.5	0.8
Rice farms with low technological inputs are prone to much risk	2.5	0.4
Damages and losses to rice farms are of divine providence	2.2	1.4
The government should fully pay for farmers' losses	1.6	0.8
Mean	**2.6**	

perception of agricultural insurance policy.

The findings are in agreement with Izuogu *et al*. (2015) who reported that rice farmers have a positive perception towards agricultural insurance schemes as this ameliorates the challenges arising from environmental hazards in rice cultivations. Farmers' perception of agricultural insurance schemes has been reported to influence their subscription.

Willingness to Pay for Agricultural Insurance

Results in Table 5 depict that rice farmers are very willing to acquire agricultural insurance policies. The mean score of ($\bar{X}$=2.7) implies that rice farmers in Anambra state are interested in acquiring insurance policies to shield their farms from the aftermath of climatic shocks such as flooding, droughts, outbreaks of pests, and diseases, etc. The findings agree with Shaibu *et al*. (2020) who attributed farmers' willingness to the high level of awareness with in-depth information on the advantages and disadvantages of agricultural insurance policy as well as a critical appraisal of how the policy functions. Since it is very difficult for agricultural production to thrive without risks, farmers will be more willing to secure insurance policies to cushion the outcome of risks. It is good to note that rice farmers believe that insurance will increase farm income and subsequently cover the cost of the premium ($\bar{X}$=2.6). Okpukpara *et al*. (2021) indicated that one of the general challenges of the utilization of agricultural insurance by farmers was the fear of farmers that these insurance agencies may not honour agreements as well as high premium. Results also show that farmers will be willing to subscribe to insurance policy the premium is jointly paid as a cooperative group. Although membership of agricultural cooperative association has been identified as a risk mitigation approach, Izuogu and Ekumankama (2015) reported that farmers who belong to agricultural cooperatives are more likely to subscribe to insurance policies more than others.

Determinants of Willingness to Pay to subscribe to insurance policy

Age, membership in cooperative organizations, previous experience with agricultural risk, debt amount, and cost of premium influence rice farmers' willingness to pay for agricultural insurance policies (Table 6).

There was a significant negative relationship between age (β=-1.832) and farmers' willingness to pay for insurance policies. This implies that as farmers grow older, the likelihood of their subscribing to insurance policies decreases. Older farmers are risk-averse, and more moderate than youths who are ingenuous, and open-minded to innovations (Gbigbi & Ndubuokwu, 2022).

Cooperative membership (β=0.250) improves the possibility of accepting rice farm insurance since farmers' associations are essential organ in the dissemination of agricultural advisory services. Also, farmers who participate actively in cooperative associations are better placed to acquire important ideas concerning the advantages of agricultural insurance as well as other agricultural innovations (Omeje *et al*.,

Table 5: Willingness to pay for agricultural insurance

Willingness indicators	Mean	SD
Can hold insurance policy without financial shock	3.1	0.7
Will be willing to pay any amount for rice farm insurance	2.8	0.6
Will be willing to pay for an insurance policy if I have access to credit	2.5	1.4
Will be interested if the premium is jointly paid as a cooperative group	2.4	1.2
Will be willing to pay if the government subsidizes the cost	2.7	0.5
Will be willing to pay in the absence of foreseeable risk	2.8	0.9
Trust agricultural insurance to increase farm income to cover the cost of premium	2.6	2.1
Mean	**2.7**	

2022; Izuogu *et al*., 2015).

From Table 6, previous experience with agricultural risk (β=1.106) positively influences the willingness to pay for an insurance policy. Rice farmers who have experienced losses as a result of previous risk may deem it necessary to subscribe to an insurance policy to support their recovery process when exposed to risk.

The debt amount (β=-2.115) had a significant negative influence on the willingness to pay for an insurance policy. This may be attributed to the difficulty in signing on for an insurance policy as a result of reduced income and pressure to clear outstanding debt. According to (Gbigbi, *et al*., 2022), though most farmers are interested in acquiring agricultural insurance policies to guard against risk, insufficient income has been reported to discourage farmers from insuring their crops as insurance may be perceived as an unnecessary extra cost.

There was a significant negative relationship between the cost of premium (β=-0.114) and rice farmers' willingness to pay for agricultural insurance. This result reveals the true condition of rice farmers because they would have greater chances of patronizing agricultural insurance schemes provided the premium is affordable. When the insurance premium is within the reach of the farmer, it will provoke interest to subscribe. However, not much will be demanded when the premium is not within the reach of the rice farmers. Expensive premium rates will reduce rice farmers' interest and significantly decrease the extent of involvement in the scheme. This aligns with Gbigbi & Ndubuokwu (2022) that high premium is a severe challenge to insurance subscriptions among smallholder farmers.

Table 6: Determinants of willingness to subscribe to insurance policy

Determinants	Coefficient
Gender	2.134
Age	-1.832**
Membership of a cooperative organization	0.250***
Awareness of an Agricultural insurance scheme	1.001
Previous experience with agricultural risk	1.106***
Access to credit	3.813**
Debt amount	-2.115***
Satisfaction with agricultural insurance information resources	3.713
Cost of premium	-0.114***

Conclusion and Recommendations

The study shows that farmers are aware of agricultural insurance with a favourable perception towards it and are also very willing to pay for the policy. However, the majority of the respondents do not have an agricultural insurance policy covering them. Membership of cooperative associations, access to credit, and previous experience with agricultural risk positively influenced rice farmers' willingness to pay for agricultural insurance policies. Debt amount, cost of premium, and age had negative influences on rice farmers' willingness to pay for agricultural insurance policy.

The government should support the formation of cooperative associations among rice farmers. Insurance premiums should be subsidized for farmers to improve their willingness to pay for the policy.

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