Farmer's response to insurance services in Akwa Ibom State Nigeria: The Nigeria agricultural insurance corporation (NAIC) experience

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Abstract
The study modelled farmers' response to uptake of agricultural insurance services in Akwa Ibom State Nigeria, a case study of Nigerian Agricultural Insurance Corporation (NAIC). The specific objectives were to, identify and categorize insurance services available to farmers in the study area, assess the level of farmer's awareness to agricultural insurance services, estimate the determinants of farmer's response to agricultural insurance services and identify the problems of access to agricultural insurance services in the study area. A simple random sampling method was used to select respondents for the study. A total of 60 respondents were selected for the study. Questionnaire and interview methods were used for data collection and data obtained were analyzed statistically (descriptive and inferential). The inferential statistical tool used for the analysis was the logit regression model. Results from the study showed that majority of the respondents were female, and were mostly literate (82.6%), most of the respondents had family size of 5-10 persons (61.7%), farming experience with the range of 5-10 years (70.5%). Majority (72.7%) of the insurance packages were agriculture and agricultural related while (27.3%) of the insurance packages were general insurance packages also, farmers were aware of the requirements by NAIC. From the logistic regression model,age and household size were significant. The main constraints were excess bureaucracy in administrative process (3.00) ranked first, Inadequate regulating environment (1.88) ranked second while delay in indemnity by insurance companies (1.40) rank third, were the most severe constraints to accessing agricultural insurance services in the study area, and Lack of/poor farmer's awareness of NAIC modality (1.33) were ranked third and fourth, respectively. The study recommended that policy makers, agricultural insurance firms, and other actors in agricultural activities should put more effort in awareness creation and symposiums on agricultural insurance packages to enable farmers to be aware of availability of packages that can mitigate their agricultural risks.

Keywords: Farmer's Response, Insurance, Indemnity, Logit Regression, Akwa Ibom

Introduction

Around the world, collective efforts are being made to produce food to feed the global population, surprisingly over 81.1 million people still go hungry and with a steady decline for more than a decade. World hunger is on the increase, affecting 9.9 percent of people globally. According to FAO 2022, from 2019 to 2020, the number of undernourished people grew by as many as 161 million, a crisis driven largely by conflict, climate change, and the COVID-19 pandemic impacts on agriculture. Weather-related events, in part associated with climate change, have also impacted food availability in many countries and thus contributed to the rise of food insecurity. Africa is suspected to be the most affected region. Economic downturns in countries dependent on oil and other primary-

commodity export revenues has also affected food availability and decreased people's capacity to produce and access food especially in developing countries. Agricultural sector over the years remained the highest source of employment especially in the rural areas, farmer's involvement in the sector is very important for food availability and supply (Obianefo, Okafor, Bola-Audu, and Umebali *2019*). This sector is constantly threatened by several factors including climate change, human activities, pest and diseases, among other issues. thus, suggesting the emergence of agricultural insurance packages. These have often prevented investors in the sector as the sector is saddled with numerous uncertainties (policies, market and price fluctuations, drought, flood, pest and disease). These uncertainties led to the danger of agricultural production loss that needs urgent attention for a continued food supply for the growing human population. Thus, Mitu (2008), suggested that the concern for risks that stifle investments and contributes to the vulnerability of rural poor is a major determinant of the various types of agricultural insurance. Insuring farmers against crop losses will attract public and private sector involvement in the provision of agricultural insurance to subsidize the effort of the government through the Central Bank of Nigeria (CBN).

Nigeria has suffered a great deal of losses in its agricultural frontier and this has continued to affect the marketing channel from the producers or farmers, to the marketers or intermediaries down to the final consumers of the agricultural products (Ogoke, 2009; Agbugba *et al.*, 2013). It should be emphasized that many farmers are less equipped to manage risk. Iheke & Igbelina (2016) observed that agricultural production decisions are taken in the environment of risk which will in turn affect production decisions. To address these issues of production risk and uncertainty which adversely affects farmers confidence in adoption and expansion of agricultural technology for food production and supply, the Federal Ministry of Agriculture and Rural Development (FMARD) in 2014 restructured and launched the Nigerian Agricultural Insurance Corporation (NAIC) to manage the risks inherent in the agricultural sector (Hansen, Debisi, Hellin and Goslinga 2016). Janzen and Carter (2019) reported that agricultural insurance is an important tool to avoid a reduction in food quality intake and exploitation of the natural resource for the future generation. Also, Dercon and Christaiensen (2011) said that agricultural insurance will encourage the access and adoption of new farm technologies totally different from what they are indigenously used to, this adoption is geared towards improving food security in an economy.

Agricultural production in most Sub-Saharan African countries is dependent on

weather. Climate change has a direct impact on the productivity of physical production factors such as soil moisture and soil fertility and this affects farming outputs which in turn impacts negatively on food production (Okoli and Ifeakor, 2015). Nigeria continues to remain the vulnerability hotspot to the impacts of climate change and the agriculture sector that constitute over 80 percent of smallholder farmers continue to be hardest hit due to low capacity to adapt and heavy dependence on rain-fed system of agriculture which is climate sensitive (World Meteorological Organization, 2020).

Problem Statement

Farming is a risk related economic activities and farmers face two main types of risk: production risk and price risk. The risk of production, or risk of return, concerns events of chance origin, related to nature, to which the producers are exposed. These shocks are linked inter alia to either rainfall and climatic variations, invasions of insects, or the occurrence of diseases. Many of the factors affecting the decisions that farmers make cannot be predicted with 100% accuracy: change in weather conditions, unstable farm prices, unavailability of hired labour at peak times, machinery and equipment could break down when most needed, draught animals might die, and government policy can change overnight. All of these changes are examples of the risks that farmers face in managing their farm as a business. The income and livelihoods of smallholder farmers are increasingly affected by financial shocks and natural forces beyond their control, such as extreme weather or crop damage from pests and diseases. Globally, less than 20 per cent of smallholder farmers have insurance to protect themselves against the impact of unexpected events (Rishi and Priebe 2020)

Farmers are naturally keen to avoid taking risks which might threaten their livelihood and is often reflected in their farming practices. However, there is a trade-off between the levels of risk that farmers can withstand and the aggregate level of food production in the country. Recognition of this trade-off by policy makers has led to the introduction of programmes that attempt to address peasant farmers' aversion to risk (Alli, 1980). One such approach is to establish a scheme to offer insurance against agricultural risks. In general, insurance is a form of risk management used to hedge against a contingent loss. Agricultural insurance is designed to provide covers for losses incurred due to reduction in expected output from agricultural products (Azubuike, 2015). Despite the contributions of agriculture to the economic development of Nigeria, as well as the introduction of agricultural insurance scheme which was designed to assist farmers in management of risk exposures there are still significant numbers of farmers who are not

insured and are having difficulties in claims processing simply because they could not meet certain conditions for their claims to be paid (Gar, 2015). So, keeping the purpose at hand, the present study identifies different factors that could be responsible for defining a farmer's attitude toward agricultural insurance service in Akwa Ibom State. The study attempted to answer the following questions: What are the types of insurance services available to farmers in the study area? Are farmers aware of insurance services in the study area? **W**hat are the socio-economic characteristics of farmers in the study area? What are factors that influences farmer's participation in agricultural insurance service? What are constraints to farmer's uptake of insurance services in the study area? The objectives of the study are to: identify and categorize insurance services, assess the level of farmer's awareness to agricultural insurance services, ascertain the determinants of farmers' response to agricultural insurance services and identify constraints to access of agricultural insurance services in the study area. Basically, risk has been identified and recognized as one of the major obstacles facing small holder farmers.

Empirical Review

Agricultural insurance is a policy which involves the insured (farmer) paying a little sum (premium), usually in percentage to an insurance company (insurer) to guarantee against loss due to any of the perils (death, flood, drought etc)

covered for a particular period of time (usually not more than one year) with a promise to indemnify (pay back the value of loss) should such occur.

Mabawonku (1998) defined insurance as the elimination of the uncertain risk of loss for the individual through the combination of a large number of similarly exposed individual who can contribute to a common fund, premium payment sufficient to make good the loss caused by any one individual. Similarly, Hansel (1998) defined insurance as a social device providing financial compensation for the effects of misfortune, the payment being made from the accumulated contributions of all parties particularly in the scheme. Mabawonku (1998) further defined risk as variabilities in outcome which are measurable in an empirical or quantitative manner. Such outcome or situations are generally characterized by measurable probability.

Adeyonu, Oyawoye, Otunaiya and Akinlade (2016) examined the determinants of poultry farmers' willingness to participate in National Agricultural Insurance Scheme (NAIS) in Oyo State, Nigeria and reported that, that age, gender, years of experience in farming, education and awareness, value of stocked birds, membership of cooperative societies, access to credit were found to influence participation in insurance services in the study area. Nnadi *et al.* (2013), focused on the socio-economic differentials of participants and non-participants

and found that, there were socio-economic differentials in the age, education, farming experience, social organization membership, the status of participants and non-participants in the scheme. Eforuoku, Balogun and Joshua (2018) investigated the determinants of utilization of NAIC among crop farmers in Osun State and found that, mean age of respondents was 41.9 years, 80.3% were males, 93.9% were married, and 53.0% had tertiary education, monthly income from agricultural activity was ₦27, 231, while 50.8% of respondents derive credit from commercial banks and had an average farm size of 9.30 acres. Radio (0.23) was the most preferred source of information and the use of crop insurance policy as collateral to obtain loan was the reasons for insured crops.

Abdulmalik, Oyinbo and Sami (2013) analysed the factors influencing crop farmers' participation in agricultural insurance scheme in the Federal Capital Territory (FCT), Abuja, Nigeria and found that 78.3% were aware of the existence of agricultural insurance scheme but only 35% of the farmers participated in the agricultural insurance scheme. Chikaire, Tijjani & Abdullahi (2015) studied rural farmers' perception, awareness and use of agricultural insurance as a hedge against climate change, the study revealed that majority of the farmers (87.3%) had no knowledge of agricultural insurance opportunity in the study area, and 75% indicated interest to participate in the scheme. Sadati *et al.* (2010)

suggested that in developing countries, the markets for formal insurance and reinsurance are either under-developed or non-existent. Also, there is lack of effective legal systems to enforce insurance contracts. These factors contributed to an inefficient agricultural insurance market performance. The development of index-based insurance (such as weather index) in developing economies, is hampered by the lack of quality information, especially from weak national meteorological services and weather observing network (Yusuf, 2010). Ogunmefun and Achike (2015), revealed that the majority of the farmers (61%) identified their major problems with the use of informal insurance measures as entry constraints which were grouped into lack of credit, lack of credit facilities, lack of working capital (assets like land) and lack of skills (education), and also high costs of inputs as problems they encountered, thus constrained the access and use of such insurance programme in the study area.

Materials and Methods

The study was conducted in Akwa Ibom State, Nigeria which is located in the coastal region of southern Nigeria lying between latitude 4^032^1 and 5^033^1 North and Longitudes 7^025^1 and 8^025^1 East. The State is bordered on the East by Cross River State, on the West by Rivers State and Abia State, and on the South by the Atlantic Ocean and the southernmost tip of Cross River State. It

occupies a total land area of 7,246 square kilometers, with a population of over 4million people (NBS, 2020). There are six agricultural zones in the state namely: Oron, Abak, Ikot Ekpene, Etinan, Eket, and Uyo, with thirty-one (31) local government areas and has very high potential for agriculture. It is suitable for food crops, tree crops, fish and livestock farming. Livestock reared includes poultry, piggery and cattle with poultry production being the dominant. The Nigerian Agricultural Insurance Company (NAIC) as an institution of government was established on the 15th of December, 1987. It was made a corporation on the 1st of June, 1993. The Nigerian Agricultural Insurance Scheme (NAIS) has been designed to benefit the small, medium and large-scale farmers, either in groups or as individual producers. The broad objective was to offer protection to the farmer from the effects of natural disasters and to ensure payments of appropriate compensation sufficient to keep the farmer in business after suffering losses. As well as providing financial supports to farmers in the event of losses arising from natural disasters; increase the flow of agricultural credit from lending institutions to the farmers; minimize or eliminate the need for emergency assistance provided by Government during period of agricultural disasters.

The population comprised of farmers in Akwa Ibom State. A simple random sample of 60 insure farmers were selected for the study. Lists of registered insured farmers was obtained from the National Agricultural Insurance Corporation (NAIC) and Bank of Agriculture (BoA) Akwa Ibom State while the list of uninsured farming population in the State was obtained from Akwa Ibom State Agricultural Development Project (AKADEP). The data used for the study were obtained from both primary and secondary sources. Primary data were obtained through personal interviews and questionnaire. Data were collected based on variables of interest as applied in the study. Secondary data were obtained from Nigeria Agricultural Insurance Cooperation. (NAIC). Data were analyzed using descriptive and inferential statistics. Descriptive statistics included frequencies and mean distributions. While inferential statistics involved the use of logit regression model specified below. The logit model is expressed as;

$$Y = \beta_0 + \beta_i X_i + e$$

where Y = dependent variable, β_0 = constant, β_1 = coefficient, X_1 = independent variable, e = residuals. Binary logit regression model specification;

$$\textbf{Logit}[\theta(Y)]_i = \textbf{Log}\frac{\theta(x)}{1-\theta(Y)_i} = \beta_0 + \beta_1 X_{1i}$$
$$\beta_6 X_{6i} + \beta_7 X_{7i} + \beta_8 X_{8i} + \beta_9 X_{9i} + \beta_{10} X_{10i}$$

$i = 0, 1,2,3, 4…. n; 1 =$ Farmers who are beneficiaries of agricultural insurance scheme, 0

= Farmers who are non-beneficiary of agricultural insurance scheme, $\text{Logit}[\theta(Y)]_i$ = is logit binary outcome of farmers who participate in agricultural insurance scheme, β_0 = constant, β_1-β_{10} = coefficients, X_{1i} - X_{10i}= independent variables, where: y = dichotomous response variable (1 for farmers who participated in Agricultural insurance scheme; 0 otherwise), X_{1i} -X_{11i} independent variables are, X_{1i} = Age of respondent (in years), X_{2i} = Household size (in number), X_{3i} = Farming experience (in years), X_{4i} = Educational level (years of schooling), X_{5i} = Annual income

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Results and discussion

The result in Table 1 shows that, the majority (72.7%) of the insurance packages were agriculture and agricultural related while (27.3%) of the insurance packages were general insurance packages. Table 1 and figure 1 shows the categories of insurance services (agricultural and non-agricultural insurance) available to farmers. It indicates that, crop subsidized policy, subsidized livestock insurance policy, flood subsidized policy and fire outbreak subsidized policy were services mostly available and rendered by the insurance scheme in the study area. This results revealed that, most of the farmers are into crop and livestock production who obtained loan from commercial and agricultural banks to boost their farm enterprises.

Table 2 shows the result of extent of farmer's awareness of agricultural insurance and NAIC as government institution for dispense of insurance services in the study area. Majority of farmers were aware that; NAIC involves staff at different stages of insurance processes with the farmers (93.3%), observed good agronomic practice (83.3%), procurement of fire fighters to reduce risk (81.7%), use a business plan for farm operation (80.0%), keeping good records of farm operations (78.3%) and access to farm land (75%).

The logistic result of the determinants to farmer's awareness on NAIC requirements is presented in Table 4. The log likelihood for beneficiaries -125.047. The more negative the log likelihood the better the model. The Likelihood ratio of 17.4 were significant at a probability level of 0.01 implying that the model is fit to explain socioeconomic characteristics effect in farmer's level of awareness on NAIC requirement. The level of education, farming experience, and farm size were not significant determinants for the beneficiaries' farmers, The determinants for programme beneficiaries are; The coefficient (0.075) of age was negative and significant at 5% level of probability, this implies that an increase in the age of programme beneficiaries will reduce their responses to NAIC requirements by a marginal effect of 0.164 unit. The coefficient (0.19) of household size was positive and

significant at 5% level of probability, this implies that a unit increase in the number of household size will increase their (farmers) responses to NAIC requirements by a marginal effect of 0.042 unit. Apart from the fact that large household size reduces the cost of labor in farm household, there is a tendency that information about NAIC modalities could be heard by any member of the family. The coefficient (8.53e-07) of annual income was positive and significant at 10% level of probability, it implies that, a unit increase in farmer's income will increase the extent of responses to NAIC requirement by a marginal effect of 1.87 unit. Increase in farmer's income as a result of programme participation is likely to increase their sources of information about NAIC operation. The researcher, therefore, concludes that the determinants of farmer's awareness on NAIC requirements were; age, household size and annual income for the programme beneficiaries and age, level of education and farm size for non-beneficiaries in the study area.

The result of constraints to access of agricultural insurance services in the study area is summarized with respect to their mean values and order of importance. With a four-point Likert scale presented in Table 4. A weighted mean value of 1.38 was used as a benchmark to rank items that described the major severe constraints face by the farmer. A mean score of 1.38 and above indicate major severe constraints while a mean score of less than 1.38 indicates a less minor constraints. The table reveals that excess bureaucracy in administrative process (3.00) ranked first, Inadequate regulating environment (1.88) was ranked second were the most severe constraints to accessing agricultural insurance services in the study area, while Inadequate regulating environment (1.88) and Lack of/poor farmer's awareness of NAIC modality (1.33) were ranked third and fourth, respectively. This implies that bureaucracy and delay in indemnification of loss to client was the most severe constraint that has mostly affected the accessibility of insurance scheme. This supports the findings of Farayola *et al* (2013) that the major problem faced by the farmers under agricultural insurance scheme was that of delay in indemnity and bureaucracy.

Conclusion and Recommendations

The favorable attitude expressed by the farmers on the requirement by agricultural insurance cooperation is an indication that they are willing to take insurance cover if encouraged to do so. However, their participation may be hindered by the constraints identified in this study. Result also indicate that the majority (72.7%) of the insurance packages were agriculture and agricultural related while (27.3%) of the insurance packages were general insurance packages also, farmers were aware of the requirement by NAIC. From the logistic

regression model, it was revealed that age and household size were factors that affect farmers response to NAIC. The main constraints were excess bureaucracy in administrative process, delay in indemnity by insurance companies, were the most severe constraints to accessing agricultural insurance services in the study area, while Inadequate regulating environment and Lack of/poor farmer's awareness of NAIC modality were ranked third and fourth, respectively.The study recommends that; Government should make agricultural insurance more affordable to farmers by increasing the present level of subsidy granted for agricultural insurance cover, insurance companies should endeavor to keep religiously to contractual arrangements so as to allay the fears of farmers that claims may not be paid. Policy makers, agricultural insurance firms, and other actors in agricultural activities should put effort in awareness and symposiums on agricultural insurance packages to enable farmers to be aware of availability of packages that can mitigate their agricultural risks.

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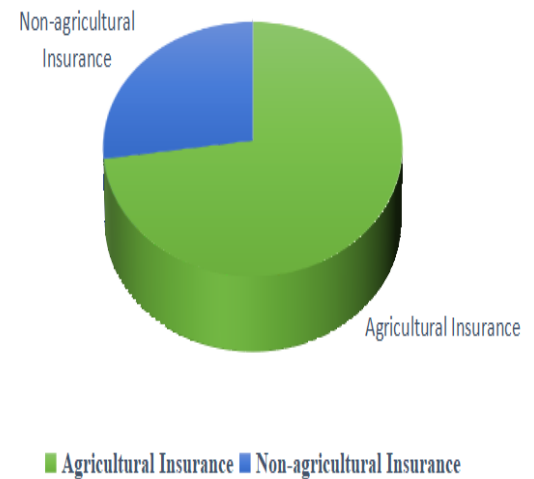
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Table 2: Extent of farmer's awareness on NAIC requirement for agricultural insurance

NAIC requirement	Aware		Not Aware	
Requirements	N	%	N	%
Access to farm land	45	75.0	15	25.0
Good and safe site selection	43	71.7	17	28.3
Involving NAIC staff at different stages of operation	56	93.3	4	6.7
keeping good operation record	47	78.3	13	21.7
Use a business plan for farm operation	48	80.0	12	20.0
Procurement of fire fighters equipment to reduce risk	49	81.7	11	18.3
Observe good agronomic practice	50	83.3	10	16.7
On the occurrence of risk, produce pictorial evidence	45	75.0	15	25

Source: Field Survey, 2022

Table 1: Insurance Service Available in the Study Area

Insurance Services	Category of Insurance	Frequency	Percentage	Subsidized Policy
Flood	Agricultural Insurance	80	25.97	Agriculture 72.7%
Fire outbreak	Agricultural Insurance	70	22.73	
Herder-farmers attack	Agricultural Insurance	60	19.48	
Pest and diseases	Agricultural Insurance	43	13.96	
Crops	Agricultural Insurance	109	35.39	
Drought	Agricultural Insurance	35	11.36	
Surface depending/yield	Agricultural Insurance	35	11.36	
Price and market	Agricultural Insurance	67	21.75	
Livestock	Agricultural Insurance	167	54.22	
Services	General Insurance	90	29.22	Non-Agriculture 27.3%
Transportation	General Insurance	49	15.91	
Total		**725***	**100**	

Table 3: Determinant of farmer's response to Agricultural Insurance

Variable	Coefficient	Marginal effect	Z-ratio
Constant	0.401442		0.64
Age	-0.07505	-0.164246	-2.64**
Educ. Attainment	0.033644	0.0073624	0.9
farming experience	0.037884	0.0082903	1.07
Household size	0.191019	0.0418017	2.17**
Farm size	0.009683	0.0021189	0.63
Annual income	8.53E-07	1.87e-07	1.51*
Log likelihood	-125.047		
Likelihood ratio	17.4		
Prob > Chi2	0.0079		
Number of obs.	60		

(*) Significant at 10%, (**) Significant at 5%, (***) Significant at 1%.
Source: Field Survey Data (2022).

Table 5 Constraints to Access of Agricultural Insurance Services

Constraints	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean	Rank
Bureaucracy	2(3.3)	6(10)	43(71.7)	9(15)	3.00	1st
Lack of/poor farmer's awareness of NAIC modality	44(73.3)	12(20.0)	4(6.7)	0(0.00)	1.33	4th
Poor record keeping by farmers	41(68.3)	19(31.7)	0(0.00)	0(0.00)	1.32	5th
Late reporting of damage slows the system	42(70)	17(28.3)	1(1.7)	0(0.00)	1.32	5th
Inadequate regulating environment	14(23.3)	40(66.7)	5(8.3)	1(1.7)	1.88	2nd
Poor sensitization of farmers	47(78.3)	8(13.3)	4(6.7)	1(1.7)	1.32	5th
Lack of insurance culture	48(80)	10(16.7)	2(3.3)	0(0.00)	1.23	8th
Crowding out by post disaster relief	46(76.7)	11(18.3)	2(3.3)	1(1.7)	1.30	6th
Non-compliance to the requirements	42(70.0)	18(30.0)	0(0.00)	0(0.00)	1.30	6th
Farmers inability to pay 4% premium	48(80)	11(18.3)	1(1.7)	0(0.00)	1.23	8th
High administrative cost due to small scale farming in the area.	48(80.0)	10(16.7)	1(1.7)	1(1.7)	1.25	7th
Delay in indemnity by insurance Companies	42(70)	14(23.3)	2(3.3)	2(3.3)	1.40	3rd
Poor documentation of events	42(70)	18(30)	0(0.00)	0(0.00)	1.30	6th

Source:Source: Field survey, 2018 N = 60, n=13 weighted mean = 17.88/13 = 1.38 no response, (x >1.38 = major constraint, X< 1.38 = minor constraint) **Note**: values in bracket represent percentage.

Field survey, 2018 N = 60, n=13 weighted mean = 17.88/13 = 1.38 no response, (x >1.38 = major constraint, X< 1.38 = minor constraint) **Note**: values in bracket represent percentage.