

AGRICULTURAL INSURANCE AS A TOOL FOR MANAGING THE EFFECTS OF CLIMATE CHANGE BY FARMERS IN PLATEAU STATE.

¹Abednego Sylvia Mijel, ²Prof. Samuel Msheliza kaku, ³Dr. Adenike Owolabi

¹biwetsylvia@gmail.com

²Sams9091@gmail.com

³owolabi_olanrewaju@yahoo.com

Department of Insurance, Faculty of Management Sciences, University of Jos.

Abstract

The study examined the impact of agricultural insurance on the effects of climate change in Plateau state. To achieve the research objectives of the study, structured questionnaire was used to collect data from 150 farmers and staff of some selected insurance companies in Jos Plateau state. Simple percentage method of data analysis was used to analyze the data collected through the use of questionnaire and chi-square was used to test the research hypothesis. Finding of the study reveals that agricultural insurance encourages farmers to adopt climate resilient practices during the period under review. Also, the result of the study showed that agricultural insurance helps farmers recover quickly from climate related losses. The result of the findings also revealed that climate resilient practices are essential for reducing the impact of climate related shocks in Nigeria. It was also found out from findings of the study that a significant relationship between climates change and agricultural insurance. Findings of the study also indicates that agricultural insurance helps mitigate the impact of floods and reducing financial risks associated with floods during the period under review. It was also found out from the result of the study that flood insurance is important in agricultural risk management strategy. The study recommended that: government should make policies that are aim at making agricultural insurance compulsory for farmers in Plateau and beyond giving the importance of insurance especially against risks related to climate change because of the impact of climate change on agriculture. Secondly, there is need for insurance companies to step up their education and sensitization of farmers on the importance of agricultural insurance because it is not all farmers that are aware of such products by insurance companies and finally, insurance companies should ensure prompt delivery and settlement of claims to those that suffer loss of any policy to serve as a motivation to others to key into the scheme.

Key words: *Agricultural insurance, climate change, climate resilience, and farmers.*

INTRODUCTION

Climate change poses significant risks to agricultural productivity and food security in Nigeria, particularly in the northern region where crops and livestock farming are predominant activities. Rising temperature and changing precipitation patterns increase the frequency and severity of extreme weather events such as floods, droughts, hails, and heatwaves, which can devastate crops and livestock. According to Haider (2019) Nigeria climate has been changing, evident in increase in temperature, variable rainfall, rise in sea level and flooding, drought and desertification, land degradation and loss of biodiversity. In Nigeria, crop production is highly

vulnerable to climate change, with a significant percentage of households in the northern region engaging in crop farming. Climate related shocks can lead to significant economic losses, threatening the livelihoods of farmers and the country's food security. Research has shown that climate change adaptations have significant impact on farm productivity (Ebele and Emodi 2016). Agricultural insurance can play a crucial role in mitigating the impact of climate change on Nigeria farmer. By providing protection against crop losses and other agricultural insurance related risks, agricultural insurance can help farmers manage climate related risk and improve their resilience to climate change. According to a report by the Food and Agriculture Organization (2018), agricultural insurance can be an effective tool for managing climate related risks in agriculture.

In many countries, insurance sector contributes to economic growth both sectorally and geographically. Since insurance sector has links to other economic sectors such as industrial, transportation, agriculture, trade and others, both locally and internationally, its relevance to general human activities has continued to grow for all ages as all categories of risks increase (Zyka and Tomori, 2014). Countries such as India, Brazil and South Africa are particularly susceptible to climate due to their dependence on rain fed farming system and limited capacity to adapt to changing weather patterns (International Fund for Agricultural Development, 2020). However, the ability of the insurance industry to contribute to the growth of an economy is dependent on its capacity. This is usually indicated by the level of development the industry has. Agriculture insurance in Nigeria has not received much patronage. It is growing at slower rate than provision of credit to the agriculture sector. This suggests that lending to the agriculture community in Nigeria does not build on the stability that available agriculture insurance in the economy provides. There are a number of factors necessitating this poor situation. Yet the situation can be seen differently. The non-reliance on insurance paints a picture of many prospects of untapped market for agriculture insurance in Nigeria.

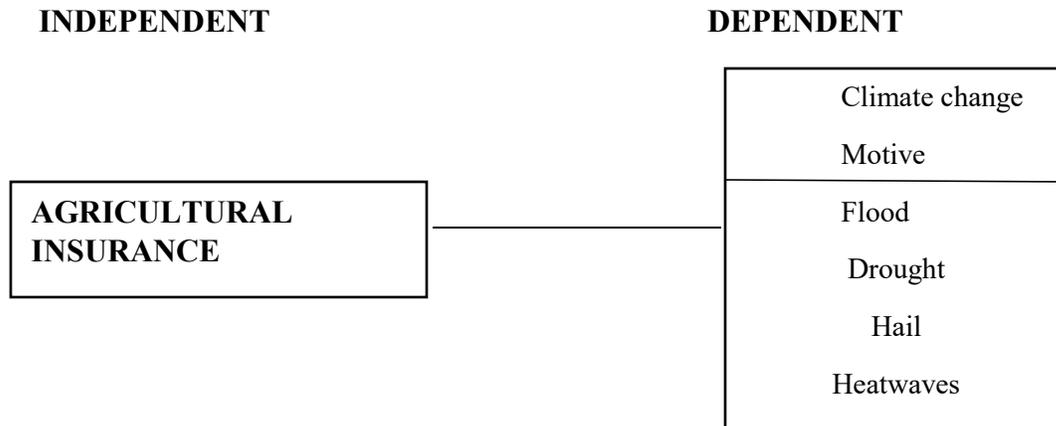
Despite their increasing significance in the face of extreme weather conditions, agricultural insurance markets remain underdeveloped in most DEMCs owing to known problems of moral hazard and adverse selection. Moral hazard occurs when farmers can influence losses because the insurer cannot accurately monitor their practices. Adverse selection, on the other hand, occurs when farmers with high probabilities of losses tend to be more likely to adopt the insurance program because of the higher expected returns of participating, compared to their counterparts with lower probabilities. An alternative is index-based insurance, where payouts depend on an index that correlates with individual farmers' losses and which farmers have no influence on, which has the potential to confront the challenges associated with the traditional indemnity-based insurance (Miranda and Farrin 2012).

STATEMENT OF THE PROBLEM

Climate change poses significant threats to agricultural production in Nigeria, with rising temperatures, changing precipitation patterns, increased frequency of extreme weather events expected to negatively impact crops yield and livestock production. (IPCC 2014). The agricultural sector in Nigeria is highly exposed to climate change, with many farmers lacking access to formal agricultural insurance programs. (NIC 2020). As a result, climate change risk can have devastating impacts on farmer's livelihood, leading to food insecurity, poverty and migration. Agricultural insurance has emerged as a potential risk management tool for farmers

to cope with climate related shocks (Hazell, Anderson and Varagiss 2022). However the impact of agricultural insurance on climate change adaptation sector remain understudied (Odjugo 2020). This knowledge gap hinder the development of effectiveness policies and strategies to support farmers in managing climate related risks. Agricultural insurance can help farmers control climate related risk by giving financial support after a climate related disaster, allowing them to regain more quickly and reduce their vulnerability to future climate related shocks.

CONCEPTUAL FRAMEWORK



CONCEPTUAL REVIEW

Insurance business has been subject to various classifications by various authorities according to different criteria. In fact, classifications of insurance are conventional from experience, based on purpose and practice of different insurance. “Ideally the distinction is not necessarily due to any legal difference between particular kinds of insurance. It may arise from varying needs of the public which it is advisable for insurers as a matter of business to attempt to meet” (Ivamy, 1979). Nevertheless, insurance could be classified on the following three main bases namely, by the function it performs; by the main classes of business and by statutory classification (Oluoma, 2010).

Climate change disrupts the agricultural environment by changing agricultural climatic factors like temperature, precipitation, and sunlight and impacting the livestock, agriculture, and hydrology industries. Floods, droughts, and increasing rainfall variability are already affecting agriculture due to climate change-induced changes in the global hydrological cycle, which negatively influence the yields of important crops, including maize, soybeans, rice, and wheat. In a warmer world, these shifts are anticipated to persist, resulting in lower crop yields from rain-fed agriculture and less water available for irrigation in areas with water scarcity (IPCC, 2022).

Floods are the most common type of natural disasters caused by heavy rains, rapid snowmelt, or storm surges caused by tropical cyclones or tsunamis in low-lying and coastal areas. Precipitation changes and rising temperature are rising sea levels, and increasing the frequency and intensity of flooding in coastal and low-lying areas in many countries around the world (Reyes, Gosme, Wolz, Lecomte and Dupraz 2021). Plants growth and yield is strongly affected by water availability (Seleiman and Hafez 2021). Higher temperature and variability in

precipitation pattern has resulted in low water availability, and future projections indicate further decline in water availability, while agricultural water consumption is expected to rise by 19% in 2050 (UN-Water, 2013). Climate change, economic and agricultural activities and population growth are leading to water scarcity (Ayt Ougougdal, Vacoubi, Messouli and Lachir 2020).

Hail is a form of precipitation that occurs when updrafts in thunderstorms carry water droplets up into the freezing level of the atmosphere, where the temperature is below freezing and the water droplets freeze into small balls of ice. Its form through a process known as accretion, where the frozen water droplets are carried upward and downward through the storm cloud, accumulating additional droplets that freeze onto the hailstone, increasing its size. (NWS 2020) Heat waves is a prolonged period of abnormally hot weather, typically lasting for several days or even weeks and it's often characterized by high temperature, humidity and heat index values (NOAA 2020)

Agricultural Insurance is a valuable business risk management tool that provides farmers with financial protection against production losses caused by natural perils, such as drought, excessive moisture, hail, frost, flood, heat waves, wind and wildlife (Governments of New Brunswick, 2019). Agricultural insurance is the stabilization of income, employment, price and supplies of agricultural products by means of regular and deliberate saving and accumulation of fund in small installment by many in favorable time period to defend the participation in bad time (Mordi, 1995). There are three types of agents that are active in providing agricultural insurance: the private for profit sector, governments (public), and other, mostly nonprofits (mutual groups, NGOs, etc.). Other agencies help finance and initiate insurance programs, including bilateral donors, United Nations (UN) organizations, multinational development banks, private foundations, and international reinsurers, but they do not deliver insurance on the ground. Few economic groups have a greater need of insurance than do the farmers. This need embraces nearly all the forms of protection offered by fire, life, and casualty insurance companies. Farm property is more exposed to wind, as well as to lightning, and, in the case of severe storms; the farm building is more subject to destruction. Farmers need accident insurance, the employer of labor on the farm needs liability insurance, as well as coverage for accidents occurring to him. Farmers need live-stock and crop insurance.

Agricultural productivity is the outcome of crop genotype and environment. Besides other sectors, agriculture is most vulnerable to climate change because any alteration in temperature and/or precipitation patterns directly influences the agriculture in terms of plant growth and finally the yield. However, this variation in yield varies from region to region. The change in production potential due to climate change will affect the trade flow too, with an estimated increase in the cereals import to developing countries (by 10–40%) by 2080 (Huang et al., 2010). The degradation in land is increasing day by day, being considered a major global threat (Arora, 2019) because it results in desertification and nutrient deficient soils. The agriculture sector is one of the major contributors to the emission of GHGs via N fertilization, livestock rearing, rice cultivation, and deforestation, but at the same time agriculture is also a great victim of environmental changes produced due to these emissions. Floods and droughts are not unknown for the world, but their frequency and intensity are expected to increase in this century, a threat to sustainable agriculture and food security. Srex (2012) reported that the near future predictions regarding climate change will have a more drastic effect on overall crop

performance, subsequently giving rise to food insecurity mainly in South Asia and Sub-Saharan Africa.

EMPIRICAL REVIEW

Oyekale, Oyedele and Ajetomobi (2022) examined climate change and agricultural insurance in Nigeria using secondary data. The study adopted the exploratory research design using a thematic analysis technique. Their study reveals that climate change has increased the frequency and severity of extreme weather events in Nigeria, affecting agricultural productivity. It reveals agricultural insurance can help farmers manage climate related risk, but its adoption is low in Nigeria. It also reveals the main challenges facing the adoption of agricultural insurance in Nigeria include lack of awareness, high premiums and inadequate government support. It recommend that government should increase awareness about agricultural insurance among farmers, insurance companies should develop affordable and tailored insurance products for farmers. Akinbode, Oyedele, and Salami (2022) studied the effects of climate change on agricultural insurance markets in Nigeria. Using econometric analysis the hypothesis tested found out that climate change has increased the frequency of extreme weather events in Nigeria. It also founds that agricultural insurance can help farmers manage climate related risk. It recommend that insurance companies should develop climate resilient insurance products subsidies should be provide to support farmers. Previous research were examined in order to determine the questions and problems that were solved and its relation to the topic under study. However, literatures reviewed did not address issues of agricultural insurance as a tool for managing the effects of climate change by farmers in Plateau State. This research believed and hope that more work would be done on this topic using the sector as case study

THEORETICAL REVIEW

Theories are formulated to explain, predict and understand phenomena and in many cases to challenge and extend existing knowledge within the limits of critical bounding assumptions Climate Risk Management Theory, Adaptation and Resilience Theory, Socio Economic Theory Climate risk management theory is the most relevant because it specifically focuses on managing climate related risks, which is a critical aspects of agricultural insurance products in Nigeria. The theory emphasizes the importance of understanding and managing climate related risks to reduce the vulnerability of farmers to climate change. The project is there for anchored on climate risk management theory. Climate change is a broad topic that crosses several academic disciplines. However, due to the rising level of interest in the issue worldwide, numerous economic and non-economic experts have tried to investigate it from various perspectives. Here is a survey of a few relevant empirical review previous research were examined in order to determine the questions and problems that were solved and its relation to the topic under study. However, literatures reviewed did not address issues of agricultural insurance as a tool for managing the effects of climate change by farmers in Plateau State. This research believed and hope that more work would be done on this topic using the sector as case study.

METHODOLOGY

Survey research is used to quantitatively describe specific aspects of a given population. These aspects often involve examining the relationships among variables and the data required for survey research are collected from people and are, therefore, subjective. The engagement of survey design was because of its ability to predict behaviour and assist in gathering identical information concerning all cases in a sample (Bordens and Abott, 2002; Aldridge & Levine, 2001). The population of the study consists of local farmers, NAIC (Nigeria Agricultural Insurance Cooperation), Leadway insurance company and IGI (Industrial and General Insurance Company) The choice of local farmers, NAIC and IGI was informed by the facts that Nigeria is a blessed country filled with different agricultural products in the country and the insurance company cover some agricultural risk. The population of the study therefore included 50 staff members and 150 local farmers of agricultural products. The two clusters resulted in total population size of 200 according to Yilkyes, (2022). There are different formulae for determination of appropriate sample size when different techniques of sampling are used. For determining representative sample size for simple random sampling technique, Smith (1983) suggested a simplified formula for sample size determination for a continuous variable or data. This is synonymous to the number of farmers in Plateau state.

SAMPLING PROCEDURE AND TECHNIQUE

This study adopted Probability sampling technique where each unit in the population has a likelihood of being selected in the sample. The elements also have a non-zero probability of being selected and the procedure involves random selection. This technique is appropriate when generalization of results is important for the study as it is in this case. Furthermore, simple random sampling technique was adopted. An important reason for adopting the simple random sampling technique is that, every unit in the population has a chance of being selected in the sample, this chance can also be accurately determined. Moreover, there is a non-zero probability for items being sampled and the procedure involves random selection. Thirdly the technique is appropriate when making generalization on results as in the case of this study.

INSTRUMENTS FOR DATA COLLECTION

The data to be used for this research will be source through primary and secondary source. The primary information will be obtained from the target population of the study who are the insurance companies in Jos. The questionnaire will be designed in a very clear, precise and understandable manner in order to obtain adequate information from the respondents (insurance companies' staff) about the impact of the naira redesigned on insurance business. The questionnaire will consist of two sections. Section A is personal information of respondents while section B will be focused on the impact of naira note redesign on insurance business. The secondary data will be source from textbooks, journals, magazines, seminar papers, internet materials, and other relevant materials.

VALIDITY AND RELIABILITY

Sequel to this research, Face and content validity was adopted because it is adjudged that, the instrument measured what it is supposed to which is primarily based upon the logical linking between the questions and the objectives of the study. Secondly, it is easy to apply than other methods of validity since the items and questions cover the full range of issues or attributes being

measured. This reliability of the instrument used in this study will be established using the Cronbach Alpha (CA) method. This is computed using the formula given as: $\alpha = \frac{Nr}{1+r(N-1)}$

Where:

a = Cronbach Alpha

N=the number of items in the scale

R = the mean inter-item correlation

According to Cooper and Schindler (2008), reliability coefficient refers to the scores obtained on a test. A reliability coefficient is a numerical value that can range from zero to one. A reliability coefficient of zero indicates that the test scores are unreliable while on the other hand a reliability coefficient of 1 indicates that it is perfectly reliable. This implies that the higher the reliability of coefficient, the more reliable or accurate the test scores. The reliability tests score of between 0.1 and 0.5 are considered weak in research while tests with scores of between 0.6 and 1 are considered strong and a good measurement of the instruments. If the reliability score is 0.7 or more, then it is accepted as very reliable in social science research. This test is necessary to assess the suitability and fitness of instrument of data presentation and analysis, hence, use of Cronbach Alpha method is justified. This test was carried out on the four research questions using a five linkert scale.

SOURCE OF DATA COLLECTION

Primary data was used for the study where questionnaires and interview schedules was used as instruments for data collection. The questions was structured (closed-ended questions).

METHOD OF DATA COLLECTION

Data was collected through field survey among local farmers, NAIC Leadway Assurance and IGI (Industrial and General Insurance). The main instrument to be employed in gathering data will be structured questionnaire due to its appropriateness to survey research (Babbie, 2005).

METHOD OF DATA ANALYSIS

Data collected were presented and analyzed using simple percentages. The researcher used the frequency table to represent raw data. The raw data were translated into percentages to enable the researcher draw reasonable conclusion based on the information used. Chi-square was used to test the research hypothesis. The chi-square was calculated using SPSS. The formula used by the researcher in the frequency table was;

$$X \times 100$$

Where;

F=Frequency

Department of Insurance

N=Number of respondents

%=Percentage

DATA PRESENTATION AND ANALYSIS

Data on the socio-economic characteristics of the respondents were collected, analyzed and presented according to sex where 88 were males with 59.4%, and 60 were females with 40.5%. This is so because majority of those who venture into the agro business are men. These men venture into the business in order to cater for their families. Respondent according to age group indicates that 1.8% of the respondents are within the age of 18-27 years, 22.9 % are within the age of two 28-37years, 36.5% are within the age of 48-57 years and 32.4% are above 58 years. This information indicates that majority of the respondents are within the age of 48-57years of age and as such, the information obtain from them will be reliable because of their experience. According to marital status indicates that married men and women are the majority of the respondents with 77.7% followed by the singles with 20.2%. There is no much difference between the Christian religion and Islamic religion (52.7 and 44.5). The respondents was well spread across the two major religion. 10.8% of the respondents are primary school leaving certificates holders, 29.7 % are secondary school certificates holders, 40.4% are holders various tertiary institution certificates.. The information shows that majority of the respondent are graduate from various tertiary institution. With their level of education, good information can be obtain for the study.

90 representing 60.2% of the respondents have 12 months and above working experience which is the highest. This means that majority of the respondents have been working for a good number of months which will make the information more reliable. Again, 42 representing 28.4% have 6-12 months working experience, while 10.8% are within their 3-6 month.

Agricultural insurance:

S/N	Statement	SA 5	%	A 4	%	U 3	%	D 2	%	SD1	%
1	Agricultural insurance encourages farmers to adopt climate resilient practices	99	66.8	36	24.3	4	2.2	5	3.3	8	2.2
2	Government should provide subsidies for agricultural insurance premiums for farmers	89	60.1	23	15.5	0	0	26	17.6	10	6.7
3	Agricultural insurance helps farmers recover quickly from climate related losses	84	56.7	64	43.2	0	0	0	0	0	0
4	Agricultural insurance is effective in reducing the financial risk associated with climate related shocks	105	71.3	23	15.5	5	3.3	10	6.7	5	3.3
5	I have experienced difficulties in claiming agricultural benefits	99	66.8	36	24.3	4	2/2	5	3.3	4	2.2
6	Agricultural insurance promote	89	60.1	23	15.5	0	0	26	17.6	10	6.7

sustainable agriculture practices											
7	The availability of agricultural insurance affects my decisions to adopt climate resilient practices	84	56.7	61	41.2	3	2.0	0	0	0	0
8	Agricultural insurance reduces the financial burden of climate related losses on farmers	110	74.3	20	13.5	3	2.0	10	6.7	5	3.3
9	Agricultural insurance is essential for managing climate related risk in agriculture	100	64.3	23	15.5	10	6.7	10	6.7	5	3.3
10	There is no significant relationship between agricultural insurance and climate change.	99	66.8	36	24.3	0	0	5	3.3	8	5.4

Agricultural insurance encourages farmers to adopt climate resilient practices. Which implies that Government should provide subsidies for agricultural insurance premiums for farmers. To help them recover quickly from climate related losses, promote sustainable agriculture practices and reduces the financial burden of climate related losses on farmers Majority of the respondents agreed that there is no significant relationship between agricultural insurance and climate change. Climate change:

S/N	Statement	SA	%	A	%	U	%	D	%	SD	%
		5		4		3		2		1	
1	Climate resilient practices are essential for reducing the impact of climate related shocks	65	43.5	45	30.7	0	0	23	14.5	15	10.1
2	Government should provide incentives for farmers to adopt climate resilient practices	89	60.1	23	15.5	5	3.3	26	17.6	10	3.3
3	Climate change will increase the demand for agricultural insurance	101	67.6	37	24.3	7	4.7	0	0	8	5.4
4	Climate information is crucial for making informed decisions about agricultural practices	99	66.8	36	24.3	0	0	5	3.3	8	5.4
	Climate resilient practices can reduce the financial risks associated with	99	66.8	36	24.3	0	0	5	3.3	8	5.4

5	climate related shocks										
6	The impact of climate change will be severe in some years to come	89	60.1	23	15.5	3	2.0	26	17.6	7	4.7
7	Farmers should prioritize climate resilient practices to reduce the impact of climate related shocks	84	56.7	59	40.3	5	3.3	0	0	0	0
8	Climate change will affects the availability and affordability of agricultural insurance	110	74.3	23	15.5	0	0	10	6.7	5	3.3
9	Climate resilient practices can improve agricultural productivity and reduces greenhouse gas emissions	65	43.5	45	30.7	3	2.0	23	14.5	12	8.1
10	There is significant relationship between climate change and agricultural insurance.	89	60.1	23	15.5	0	0	26	17.6	10	6.7

Climate resilient practices are essential for reducing the impact of climate related shocks. This implies that Government should provide incentives for farmers to adopt climate resilient practices. Because climate change will increase the demand for agricultural insurance. Climate resilient practices can reduce the financial risks associated with climate related shocks. Farmers should prioritize climate resilient practices to reduce the impact of climate related shocks.

If $X^2_{\text{calculated}}$ is greater than the tabulated X^2 at 5% level of significance, we reject the null hypothesis (H_0)

If $X^2_{\text{calculated}}$ is less than the tabulated X^2 at 5% level of significance, we accept the null hypothesis (H_0)

Agricultural insurance does not reduce flood vulnerability among plateau State farmers

	<i>Agricultural insurance does not reduce flood vulnerability among plateau State farmers</i>
Chi- square	28.37
Df	2

Asymp. sig.	.000
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From the calculation above through the use of statistical packages for social science (SPSS), it is observed that $X^2_{\text{calculated}}$ is 28.35 greater than the $X^2_{\text{tabulated}}$ which is 16.93 Therefore, we reject the null hypothesis and accept the alternative hypothesis and conclude that agricultural insurance reduce flood vulnerability among plateau State farmers

If $X^2_{\text{calculated}}$ is greater than the tabulated X^2 at 5% level of significance, we reject the null hypothesis (H_0)

If $X^2_{\text{calculated}}$ is less than the tabulated X^2 at 5% level of significance, we accept the null hypothesis (H_0)

Agricultural insurance has no significant impact on mitigating the effects of drought on plateau state farmers.

Agricultural insurance has no significant impact on mitigating the effects of drought on plateau state farmers..

Chi- square	23.15
Df	2
Asymp. sig.	.000

From the calculation above through the use of statistical packages for social science (SPSS), it is observed that $X^2_{\text{calculated}}$ is 23.15 greater than the $X^2_{\text{tabulated}}$ which is 16.93 Therefore, we reject the null hypothesis and accept the alternative hypothesis and conclude that Agricultural insurance significantly mitigates drought impacts on plateau state farmers

DISCUSSION OF FINDINGS

The study examines agricultural insurance as a tool for managing the effects of climate change by farmers in plateau state. Finding of the study reveals that agricultural insurance encourages farmers to adopt climate resilient practices during the period under review. Also, the result of the study indicates that agricultural insurance helps farmers recover quickly from climate related losses in line with the study of Ayeni & Nwaoboli (2023). It was found out from the findings of the study that agricultural insurance helps farmers recover quickly from climate related losses during the period. The result of the findings also indicates that agricultural insurance reduces the financial burden of climate related losses on farmers. The result also reveals that there is significant relationship between agricultural insurance and climate change in Nigeria during the period under review. The result also concord with the finding of Srijana & Fatta, (2021) on the role of agricultural insurance on climate change. It was found out from the result of the findings that significant relationship between agricultural insurance and climate change in the study area during the period.

The result of the findings also reveals that climate resilient practices are essential for reducing the impact of climate related shocks in Nigeria. The result also shows that climate change will increase the demand for agricultural insurance in Nigeria during the period under review. The result is also in line with the study of Botzen, Bouwer, & Scussolini (2018). It was discovered from the result of the study that climate increase the demand for agricultural insurance during the period under review. It was also found out from findings of the study that a significant relationship between climates change and agricultural insurance. The result of the findings also shows that farmers should prioritize climate resilient practices to reduce the impact of climate related shocks because majority of the respondents strongly agreed that prioritizing climate resilient practices to reduce the impact of climate related shocks by famers.

Findings of the study also indicates that agricultural insurance helps mitigate the impact of floods and reducing financial risks associated with floods during the period under review. It was also found out from the result of the study that flood insurance is important in agricultural risk management strategy. The result is also in lines with the study of Hazell, Anderson, Jock & Varangis, Panos (2022) on the impact of agricultural insurance developing counties. Findings of the study indicates that insurance is important in agricultural risk management strategy during the period under review. Findings of the study also indicates that insurance reduces the financial burden of flood related losses on farmers and also helps farmers recover quickly from flood related losses.

The result of the hypotheses tested indicates that agricultural insurance reduce flood vulnerability among plateau State farmers. Since the result of the chi-square reveals that the chi-square calculated is greater than the chi-square tabulated. The result also indicates that there is a significant relationship between agricultural insurance droughts mitigates in the study as the coefficient of chi-square was greater than the tabulated result. The result of the third hypothesis also reveals that agricultural insurance has significant impact on enhancing plateau farmers resilience to heat waves as indicated by the result of the chi-square.

CONCLUSION, RECOMMENDATION AND LIMITATION

The study examines agricultural insurance as a tool for managing the effects of climate change by farmers in Plateau State insurance is an effective tool for risk management in agriculture. Findings of the study indicates that agricultural insurance encourages farmers to adopt climate resilient practices, it also help in reducing the financial risk associated with climate related shocks, the result also indicates that climate resilient practices are essential for reducing the impact of climate related shocks. Also, agricultural insurance helps mitigate the impact of floods, drought and related risks in agriculture. The findings of this study showed that majority of the respondents were not aware of agricultural insurance. It is observed that the major challenges faced by farmers in the course of patronizing agricultural insurance were inadequate knowledge, high premium, and delay in assessment of losses, delay in claim payment, administrative bureaucracy and lack of confidence in the institution.

Government should make policies that is aim at promoting agricultural insurance and making it compulsory for farmers in Plateau and beyond especially those in flood prone areas since findings of the study indicates that agricultural insurance reduce flood vulnerability among plateau State farmers. Secondly, there is need for policy makers to develop insurance policies

that specifically address drought related risk Government should make policies that is aim at promoting agricultural insurance program that cover hail damage to support farmers financial stability since findings of the study indicates that agricultural insurance have a positive impact on plateau state farmer's recovery from hail damages Farmers should be encourage to buy insurance policies that cover heat wave related risk since finding of the study indicates that agricultural insurance enhances plateau state farmers resilience to heat waves.

One of the major challenges that the researcher encounter during the study is that some of the respondents who were in the right position to supply the researcher with adequate information about the study were not ready to do so for reasons best known to them. Secondly, Time and finance was also a constraint to the researcher when carrying out the study. Some farmers are aware of the agricultural insurance policies but the premium rate is not favorable for them to buy. Also some of the farmers complain that most insurance company insured against pest and diseases not against natural disaster.

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