

## **Assessing Farmers' Behavioural Metrics, Participatory Influences, and Demand-side Barriers of Agricultural Insurance in South-West, Nigeria**

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### **Abstract**

*Agriculture is critical to economic prosperity of Nigeria and to a large extent, the economic wellbeing of Africa. However, this paper evaluated the judgments of farmers regarding agricultural insurance on the basis of their behavioural metrics, participatory influences, and demand-side barriers in Nigeria. The study employed descriptive cross-sectional design coupled with survey approach. A structured questionnaire was developed in Google form and posted electronically via the WhatsApp created to which registered farmers were added. This study, therefore, captured the thoughts, experiences, and observations of the selected farmers in Nigeria. This study found that farmers' desires and patronage toward agricultural insurance policies had been positively initiated in terms of awareness, knowledge, and preference for agricultural insurance, while negatively affected in terms of their experiences. Thus, while the farmers' genders are unimportant, farmers' family sizes, and farmers' ages were both slightly important, farmers' formal education and experiences were considered moderate influencers, access to credit and insurance experts showed the highest probability of importance to farmers' participations in agricultural insurance. Conclusively, the unavailability of government subsidies to farmers affirmed strongly that 68.8 percent stand out as the greatest barrier to demand for agricultural insurance. This study suggests that tailored-made agricultural insurance policies which embed access to low interest credit facilities from agricultural bank be designed to boost farmers' economics of scale in Nigeria.*

**Keywords:** Agricultural risk, Agricultural insurance, Demand factor, Nigeria

**JEL Codes:** G22, Q14, Q18

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### **1. Introduction**

Agricultural productivity is a sine quo non to the survival of mankind guaranteed through food safety. According to Alliance for Green Revolution in Africa (AGRA) (2018), not less than 70% of the African populace is said to be involved in agriculture. It is evident from this submission, that agricultural innovation is the path to prosperity in Africa because no region of the world has developed into a diverse modern economy without first establishing a successful foundation in agriculture. However, Agriculture is critical to the development of Africa and crucial to the achievement of the Sustainable Development Goals, which seeks to eradicate extreme poverty and hunger by 2030. Therefore, most reliable instrument

that agricultural producers and farmers can intensely adopt in mitigating the numerous risks related with adverse circumstances is agricultural insurance (An, He, & Zhang, 2023; Jatto, 2019).

However, studies (such as Egbeadumah, Aboshi, & Zarewa, 2022; Shang, & Xiong, 2021; Thomas, 2018) had noted that agricultural risk management is a major coping strategy for farmers to enhance their productivity and income generating capacity. Agricultural producers are vulnerable to a number of constraints which depend upon a farm's location, the agriculture production mechanisms, the climatic and market environment (Food and Agriculture Organisation, 2017; Lencucha, Pal, Appau, Thow, & Drope, 2020). Meanwhile, farm risk management is a combined approach (be it formal or informal), depending upon the availability of agricultural produces, and core constraints within an agricultural production circle. Constraints to agricultural production are primarily high in low-income countries with restricted financial activities, unevolved infrastructure, and absence of regulation and market access (An *et al.*, 2023; Ankrah *et al.*, 2021). Therefore, understanding farmers' perceptions of and attitude toward risks and coping plans is vital in farmers' behavioural pattern (Huet, Adam, Giller, & Descheemeaker, 2020; Sayavong, 2016), as this will aid in determining their capacities to deal with uncertainties (Hohl, 2019).

Given the current economic situation in Nigeria coupled with hyperinflation and hunger in the land, the government is supporting the farmers to revamping the agricultural sector with the desire to not only bolster their efforts but also, to restore the lost glory of Nigeria in self-adequacy in food production and supply. These efforts had been geared toward motivating more enterprise into agriculture (whether as an investor or a farmer) to curtail the increasing rate of unemployment and thus, intensifying the economic diversification plan of the government. It has evidently proven, from several studies (such as Delay, Brewer, Featherstone, & Boussios, 2020; Li, & Wang, 2022; Raithatha, & Priebe, 2020) that the most scientific and appropriate economic means for managing the various agricultural risks is having a risk financing instrument like agricultural insurance policies for the farmers.

Therefore, it is essential to recognise the pivotal role of agricultural insurance in protecting farmers against possible agricultural risks (such as production risks, logistics and infrastructural risks, human risks; price or market risks; institutional risks, financial risks, legal and environmental risks etc.). Agricultural risk is a major

focus area in farming globally due to the threats of pests and diseases, herders' activities, bush fires, drought, and price fluctuations. In Nigeria, farmers have been disturbed and traumatised by the activities of herders, bandits, kidnappers, and political unrest, among others. Yet a great majority of them, because of inadequate pecuniary means and resources, are rarely able to combat the risks, especially when it involves calamitous losses. The resulting consequence, often, is a sharp decline in farm income and the resultant agricultural value chain failure (Udemezue & Kanu, 2019).

Agricultural and food policy is central to various pressing societal matter today; and the economic analysis occupies a privileged place in modern policy debates. However, agricultural production is critical to food safety and sufficiency to humanity. Studies (such as Brauw & Bulte, 2021; Gulati, Ganguly, & Wardham, 2022; Hernandez & Kacprzyk, 2021; Williams, 2014) had contributed to the economic and institutional policies to driving the agricultural participation, production, and development in the world. The behavioural dispositions of the farmers, and their participations in agriculture had been a course for concern. This concern had been associated with numerous risks, and a call for an appropriate risk control mechanism, in term of agricultural insurance, to address these risks. Farmers' understanding and knowledge of agricultural insurance had affected their patronage and preferences. These preferences can be said to be affected further by a number of barriers for which they would desire to demand agricultural insurance.

Therefore, the crux of this study is to investigate farmers behavioural metrics, their participatory influences, and demand barriers for agricultural insurance in South-West, Nigeria. In specific terms, the objectives are to take an overview of agricultural insurance in Nigeria; review past studies on farmers' perceptions, preferences, and participations toward agricultural insurance; study behavioural disposition of farmers towards agricultural insurance; assess farmers' participatory influences for agricultural insurance among farmers; and examine the demand-side barriers for agricultural insurance among farmers in Southwest, Nigeria.

## **2. Review of Related Literature**

### **2.1. Agricultural Insurance: Developmental Perspective**

Agricultural insurance is a financial instrument which provides coverage for agricultural production assets of all biological systems including crop, forestry, livestock, fishing, and farm properties. Agricultural insurance is one of the alternative risk management methods available for risk management against

climatic variations (Abdi, Raffar, Zulkafli, Nurulhada, Rehan, Muharam, Khosim, & Tangang, 2022; Ghosh, Gupta, Singh, & Ward, 2021). It serves as the only medium through which production risks in agriculture are ceded from individual producers, agro-enterprises, and government organisations to (re) insurers or other financial markets (Hohl, 2019).

Agricultural insurance is a world billion-dollar sector increasing at a speedy rate. Thus, the agricultural insurance market in the year 2019 worth more than 30 billion U.S. dollar (Wang, Tack, & Coble, 2020; Vyas, Dalhaus, Kropff, Aggarwal, & Meuwissen, 2021). However, climate change, in many regions of the world, has been ascribed an essential driver of agricultural system instability and is anticipated to increase the probability and severity of risks. Therefore, among numerous agricultural risk management instruments available, one major plan of action to manage these risks is agricultural insurance (Vyas et al., 2021). Agricultural insurance, according to Siwedza and Shava (2020), can help stabilise farmers' income with resultant reduction in poverty (Sustainable Development Goals. SDG 1), ensuring a climate safety cover for food producers (SDG 13) and creating more welfare packages to address hunger (SDG 2).

## **2.2. Theory of Planned Behaviour**

This theory was propounded to explain behavioural intent of mankind and its adoption decisions. It is thus called the theory of reasoned action, which assumes that human disposition is fully volitional and the insinuated intent, which is encapsulated by subjective norms and attitudinal expressions (Fishbein & Ajzen, 1975). Ajzen (1991) as cited in Zeweld, Huylenbroeck, Tesfay, and Speelman (2017) expressed criticisms regarding the volitional assumption of mankind, when he noted that some mankinds may not be affected due to external factors. Under this theoretical framework, intent turns out as a weighted function of human attitude, perceived control, and subjective norms.

More so, Taylor and Todd (1995) as cited in Brahmama, Brahmama, and Memarista (2018) argued the one-way dimensional belief, which further reclassified attitudinal belief components into perceived compatibility, usefulness, easiness, and self-efficacy. This theory serves as the basis for which conceptual framework is developed; as it explains farmers behavioural metrics, participatory influence, and demand-side barriers of agricultural insurance in South-West, Nigeria.

### **2.3. Review of Previous Studies**

Several surveys have been conducted both in Nigeria and other countries to identify the relevance of agricultural insurance in relation to agricultural productivity and how they are in relations to farmers bahavioural disposition, perceptions, preferences, and barriers to its demands (e.g., Ajiboye, Adeyonu, Faseyi, & Isitor, 2018; Benjamin, Olusegun, & Ikenna, 2021; Ojetunde, 2021; Li, & Wang, 2022; Raithatha, & Priebe, 2020).

In reference to a study of Duong, Brewer, Luck, and Zander (2019), a world review of farmers' perceptions of agricultural risks and related risk management strategies were conducted. The study adopted a data reduction technique (i.e., factor analysis), and descriptive statistics, from 197 studies, where it was established that weather-related risk, biosecurity threats, and human risks were perceived significant risks encountered by farmers in their agro-business. The study pointed that the core barrier to successfully handling agricultural risks, in developing countries, were restricted access to appropriate information, and official low-interest loan mechanisms. The study observed discrepancies between sources of perceived risks and strategies for risk management. The review proposed aspects for future studies to enhance thoughts of farmers perceived risk exposures and thus, develop procedures for handling and reducing these risks.

Ali, Egbendewe, Abdoulaye, and Sarpong (2020) examined the willingness to pay for weather index-based insurance in semi-subsistence agriculture in Northern Togo. The desired model approach adopted is based on data gathered from 704 randomly chosen individuals in Northern Togo, West Africa. A descriptive statistic in the choice of frequency percentage was employed in the data analysis. Results from the study proved that farmer perceived willingness has a major role in most affected food crops. The study while suggested more insight to assist the propagation of more advisory activities; it prays for more farmers' preferences toward managing agricultural risks.

Shang and Xiong (2021) embarked on a study aimed at assessing farmers' risk management strategies on their adoption willingness. The study was descriptive in its design and employed a structured survey for gathering data from 469 participants. In an attempt to decisively analyse the data collected, a descriptive technique was adopted. The study established empirical evidence that indicated farmers limited information access to insurance, which deeply affect their willingness. The study suggested information dissemination to farmers to enable

them access insurance policies, and thus, help increase their desire to adopt insurance, as the right risk management strategy.

Ngango, Nkurunziza, and Ndigijimana (2022) conducted their study by assessing rural farmers' willingness to pay for crop insurance scheme, with empirical evidence from Rwanda. The study adopted cross-sectional survey design with the sample size of 325 households. The findings from the study established the determinants of willingness to pay (comprising formal education, income, land tenure, farm size, and credit access of farmers) all positively influenced insurance premiums the farmers were readily prepared to pay, whereas household (family) size influenced negatively. The study suggested policy plan that can help strengthen the formal education of rural farmers to enhance their participation in crop insurance. It also suggested an improved farmers' credit access to increase their pecuniary capacity.

Bannor, Oppong-Kyeremeh, Amfo, Kuwornu, Kyire, and Amponsah (2023) research was based on the relationship between agricultural insurance and risk management, as evident among Poultry farmers in Ghana. The study made use of random parameter logit and conditional logit models in the data analysis. In the data analytical process, certain insurance attributes were considered comprising period of premium, type of participation, price paid per annum, risk covered, and amount covered. The findings from the study revealed that price, family size, and type of participation have negative influence on agricultural insurance uptake, while farmers' formal education, farming experiences, risk covered, and premium period have positive influence on farmers' uptake of agricultural insurance.

### **3. Methodology**

This study, which was empirical, adopted descriptive analysis, captured the thoughts of farmers with respect to agricultural insurance policies on issues relating to their behavioural metrics, participatory influencing factors, and demand-side barriers toward agricultural insurance. This study employed survey design supported by quantitative method to provide clarity to farmers' perceptions of necessary decisions regarding agricultural insurance policies in Nigeria. The total number of individuals set for this study were registered and practising farmers in Nigeria (The Guardian, 2021).

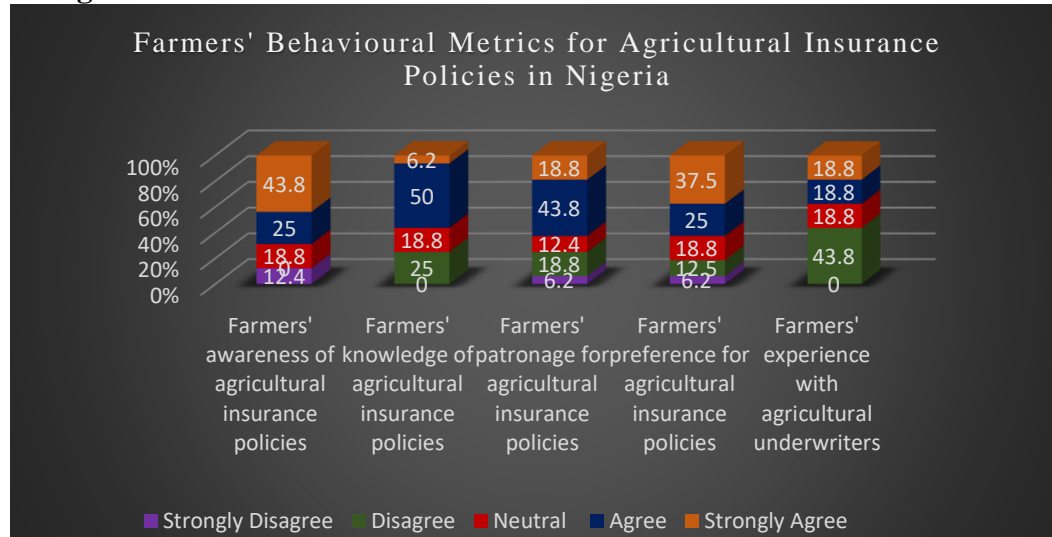
The sampling method adopted were purposive and convenience in nature. The data collection instrument selected for this study was a questionnaire, being a primary

source. The questionnaire was developed in a Google form and posted electronically via the WhatsApp created to which registered farmers were added. The choice of the survey method was due to its suitability to the chosen research design, its costless nature, huge sample coverage, and its simplicity in distribution (Sallies, Gripsrud, Olsson, & Silkoset, 2021). The web-based app helped to create forms for data gathering exercise (Okoroma, 2021; Thuan, 2018). The adoption of this online survey instrument helped to save researchers' time, and reduce the number of papers that would have been printed on (Nguyen, Stehr, Eisenreich, & An, 2018). To this end, a total of 64 respondents got back with their responses duly captured.

The study measurement of validity consisted of construct, and face validity. While construct validity was structured in line with convergent and discriminant views of earlier studies, face validity was conducted among experts in agricultural and insurance to be able to come up with useful research instrument for the data gathering. Thus, the reliability test was conducted with a Cronbach alpha above the standard 0.7 for all constructs of concern. These outcomes were in line with statistical inferences of the correctness of the scale, and the sanctity of the internal consistency.

## 4. Result and Discussions

### 4.1. Behavioural Metrics for Agricultural Insurance Policies among Farmers in Nigeria



**Figure 4.1:** The graphical model explains Farmers' behavioural metrics for agricultural insurance policies

**Source:** Field Survey, 2023

Figure 4.1 explains farmers' behavioural metrics for agricultural insurance policies in Nigeria in terms of awareness, knowledge, patronage, preference, and experience. For the statement that '*farmers are aware of the various agricultural insurance policies*', while 12.4 percent disagreed with it, 18.8 percent neutral, 25 percent expressed their agreement, and 43.8 percent were strongly in agreement with the statement. This implies that while 68.8 percent agreed totally with the statement, only 12.4 percent expressed their utmost disagreement. For the statement '*farmers understand the use of agricultural insurance policies in Nigeria*', while none expressed their strong disagreement, 25 percent disagreed, 18.8 percent stood neutral, 50 percent showed their agreement, and 6.2 percent showed their strong agreement of the statement. This invariably indicates that while 25 percent expressed their disagreement, 56.2 percent were in agreement with the statement.

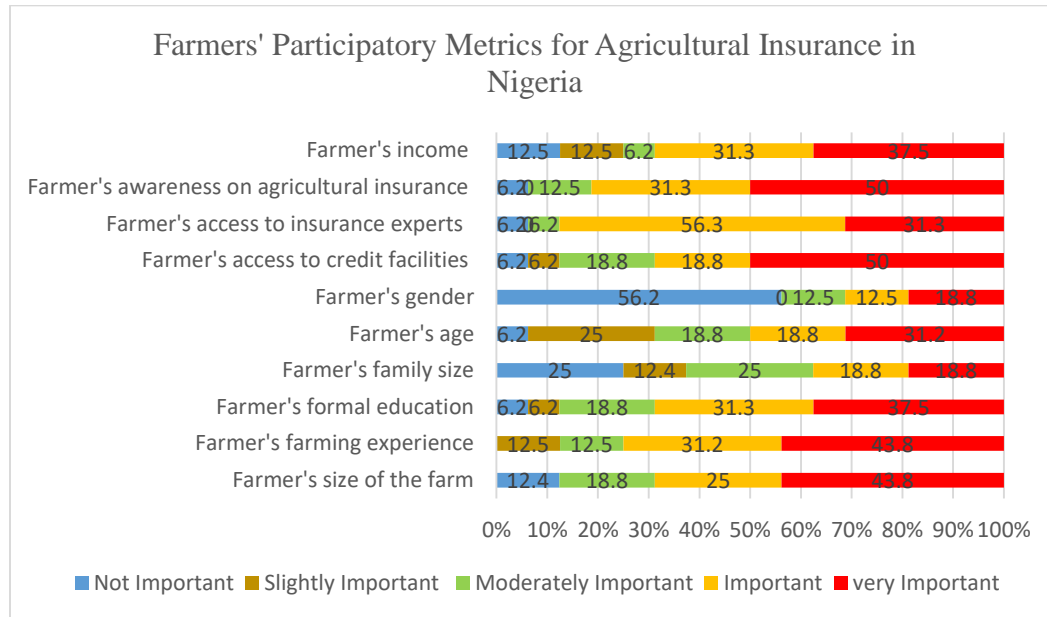
For the statement that '*farmers are interested in purchasing agricultural insurance policies*' while 6.2 percent signified their strong disagreement, 18.8 percent disagreed, 12.4 percent were neutral, 43.8 percent displayed their agreement, and



18.8 percent showed their strong agreement. This, in turn, signifies that over 62.6 percent agreed with the statement. For the statement that *'farmers prefer to use agricultural insurance to manage agricultural production'*, while 6.2 percent displayed their strong disagreement, 12.5 percent disagreed, 18.8 percent were neutral, 25 percent agreed, and 37.5 percent expressed their agreement strongly. This shows that more than 62.5 percent agreed with the statement. For the statement that *'farmers have good experience with insurance companies on agricultural production'*, while 43.8 percent indicated their disagreement, 18.8 percent each were for neutral, agreement, and strongly agreed. This implies that more farmers (43.8 percent) have shown their disagreement with the statement and 37.6% had pleasant experience.

From the above, it shows clearly that farmers' desires and patronage toward agricultural insurance policies, based on their judgment, had been positively initiated in terms of awareness, knowledge, and preference for agricultural insurance, while negatively affected in terms of their experiences. This result is supported by previous studies (such as Gbigbi & Ndubuokwu, 2022; Huang, Zuo, Sun, & Guo, 2020; Jamanal, Natikar, & Halakatti, 2019; Jatto, 2019). However, a strong correlation was expected between awareness and knowledge of agricultural insurance; but 43.8% had very strong awareness and 6.2% had strong knowledge of agricultural insurance. This implies that awareness had been derived more or less informally rather than from formal sources.

## 4.2. Participatory Metrics for Agricultural Insurance among Farmers in Nigeria



**Figure 4.2:** The graphical model explains farmers' participatory metrics in agricultural insurance in Nigeria

**Source:** Field Survey, 2023

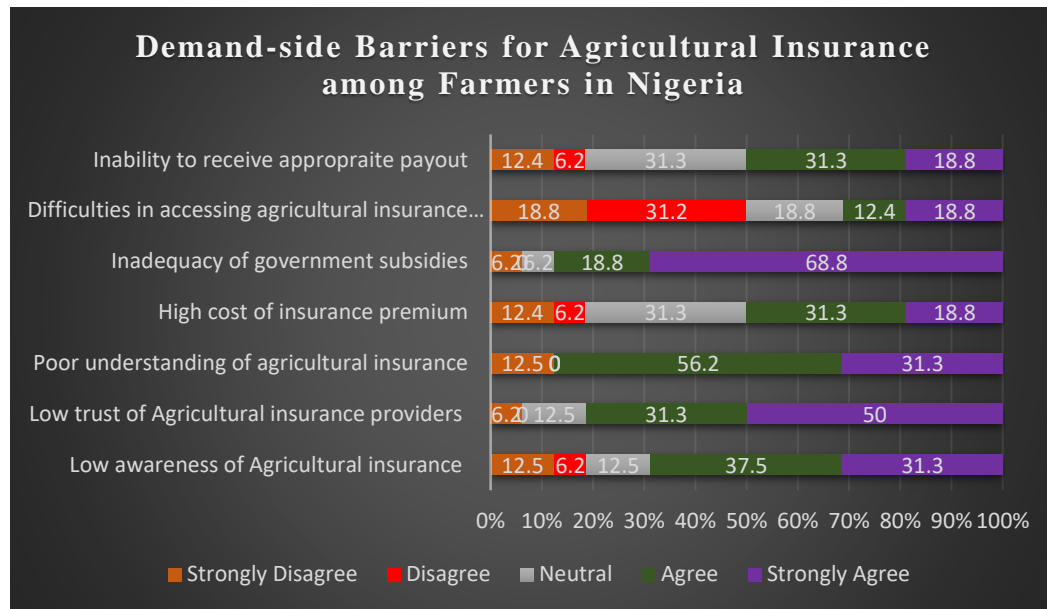
Figure 4.2 revealed the participants' responses regarding participatory metrics affecting agricultural insurance policies among farmers in Nigeria. For '*farmer's size of the farm*', while 12.4 percent did not attach any importance to it, 18.8 percent expressed their slight importance, 25 percent showed some level of importance, and 43.8 percent gave it highest importance. For '*farmer's farming experience*', while 12.5 percents of the entire participants indicated both slight and moderate importance each, 31.2 percent signified their importance, and 43.8 percent displayed very high level of importance. For '*farmer's formal education*', while 6.2 percent expressed no importance and slight importance to it, 18.8 percent gave their moderate importance, 31.3 percent indicated some level of importance, and 37.5 percent displayed very important. For '*farmer's family size*', while 25 percent see it as not important, 12.4 percent and 25 percent indicated slight and moderate

importance, 18.8 percent each for those participants who expressed importance and highest importance respectively.

For '*farmer's age*', while 6.2 percent expressed no level of importance, 43.8 percent showed slight importance, 18.8 and 31.2 percents accounted for some level of importance and highest importance respectively. For '*farmer's gender*', while 56.2 percent of the entire participants attached no importance to this metric, 12.5 percent accounted each for both its importance and slight importance. 18.8 percent, then, saw it as extremely important. For '*farmer's access to credit facilities*', while 6.2 percent each see it for no importance and slight importance; and 18.8 percent each showcased moderate importance and importance, 50 percent expressed their extreme importance. For '*farmer's access to insurance experts*', while 6.2 percent each accounted for both no importance and slight importance, while 56.3 percent signified some level importance, and 31.3 percent indicated it as extremely important.

For '*farmer's awareness on agricultural insurance*', while 6.2 percent accounted for no importance, 12.5 percent made a moderate importance of it, 31.3 and 50 percents both accounted for some level of importance and extreme importance respectively. For '*farmer's income*', while 12.5 percent did not see it as important, 18.7 percent sees it as slightly important. 31.3 and 37.5 percents both accounted for some level of importance and extreme importance respectively. These results proved clearly that while the farmer's gender is unimportant as a major participatory metric for agricultural insurance, farmer's family size, and farmer's age were both slightly important, farmers' formal education and experience were considered moderate influencers while access to credit and insurance experts should have highest probability of importance to farmers' participations in agricultural insurance. The results, therefore, are consistent with previous studies (such as Ankrah, Kwapong, Eghan, & Adarkwah, & Boateng-Gyambiby, 2021; Bhuiyan, Davil, XinBin, & Zurong, 2022; Shaibu, Ibitoye, Ibrahim, & Shaibu, 2019; Zwanck, 2019).

#### 4.3. Demand-side Barriers for Agricultural Insurance among Farmers in Nigeria



**Figure 4.3:** The graphical model explains demand-side Barriers for agricultural insurance among farmers in Nigeria

**Source:** Field Survey, 2023

Figure 4.3 revealed the participants' responses regarding the demand-side barriers for agricultural insurance farmers in Nigeria. For 'low awareness of agricultural insurance', while 31.3 percent of the participants strongly agreed to the statement, 37.5 percent expressed their agreement, 12.5 percent each accounted for participants who strongly disagreed and showed neutral response. Only 6.2 percent disagreed. For 'low trust of agricultural insurance providers', 50 percent accounted for strong agreement and 31.3 percent agreed. While 12.5 percent became neutral, 6.2 percent indicated their strong disagreement.

For 'poor understanding of agricultural insurance', while 56.2 percent of the entire participants showed their agreement, 31.3 percent expressed their strong agreement to the statement. Only 12.5 percent was accounted for those participants with strong disagreement. For 'high cost of insurance premium' 31.3 percent was accounted

each for those participants whose responses were both neutral and in agreement with the statement. While 18.8 percent showed their strong agreement, 12.4 percent displayed their strong disagreement. Only 6.2 percent disagreed. For '*inadequacy of government subsidies*', while 68.8 percent of the participants agreed strongly with the statement, 18.8 percent expressed their agreement. 6.2 percent accounted each for both strongly disagreed and neutral. For '*difficulties in accessing agricultural insurance policies*', while 12.4 percent were in agreement with the statement, 31.2 percent disagreed. More so, 18.8 percent was recorded each for those participants with strongly disagreed, strongly agreed, and neutral. For '*inability to receive appropriate payout*', 18.8 percent accounted for participants with strong agreement, while 31.3 percent was recorded each for both participants with agreed and indecisive responses, 6.2 percent disagreed, and 12.4 percent strongly disagreed.

From the above, it reveals clearly that the participants seem not to have experienced difficulties in accessing agricultural insurance policies due to their level of disagreement, while high level of agreements were expressed to other demand-side barriers. Indeed, unavailability of government subsidies to farmers affirmed strongly that 68.8 percent stand out as the greatest barrier to demand for agricultural insurance. This is theoretically plausible as subsidies were expected to boost output which will positively impact more on payout and income of farmers, and therefore, demand for agricultural insurance policies. This result is supported by other studies (such as Ghosh, Gupta, Singh, & Ward, 2021; Nshakira-Rukundo, Kamau, & Baumuller, 2021; Sujarwo, 2017) regarding agricultural insurance.

## **5. Conclusion and Recommendations**

Without iota of doubt, agricultural risks (such as pests, diseases, droughts, fire, climate change, farm property damages, personal risks, etc.) present critical challenges to farmers and their related income, perceptions, preferences, and other economies of scale for survival. This study therefore investigated the behavioural metrics of farmers, study subsisting factors influencing farmers' participations in agricultural insurance, and examined the demand-side barriers of agricultural insurance among farmers in Nigeria. Analysis had been conducted and findings being drawn, which showed the opinions of the selected participants. It is evident that farmers' behaviors are influence most significantly by lack of insurance expertise to provide overreaching support for the adoption of agricultural insurance in Nigeria. Also access to low interest credit still impinges on the ability to address

economics of scale which could further assist to boost income leading reducing barriers to demand for agricultural insurance.

Based on these outcomes, the researchers suggested that agricultural insurance providers should enhance and expand their value-chain processes in a bid to bolster farmers' production capacities. However, government should expand the subsidy net for more farmers to have access. Insurance providers should, indeed, design their agricultural insurance policies in the simplest and most acceptable form, so as to attract farmers' beliefs and patronage.

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