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Agricultural Risk Financing Strategies and Food Safety Control: Evidence from Selected Smallholder Farmers in Ekiti State, Nigeria

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Abstract

Increasing agricultural risk financing methods can help farmers make more money and guarantee good property protection. They are also effective tools for maintaining food safety and management. The relationship between food safety and control metrics and agricultural risk financing strategies among smallholder farmers in Ekiti State was investigated in this study. The study used a cross-sectional survey design with double sampling, which included convenience and judgmental sampling. A structured questionnaire was used in the study to collect information from 121 participants in the sample population. In the data analysis, descriptive statistics and a basic regression technique was used. This study therefore confirmed a positive nexus between agricultural risk financing strategies and food safety and control in Ekiti State, Nigeria. In an effort to support farmers' output capacities, the agricultural insurance providers should improve and broaden their value-chain procedures. To provide more farmers access, the government should broaden the subsidy network. It is true that insurance companies should create their agriculture insurance plans in the most straightforward and palatable way possible in order to win over farmers' trust and business. In order to generate cash for agricultural cooperators to supply food and manage potential risk factors that can arise, agricultural cooperative societies should be reinforced.

Keywords: agricultural risk, risk financing, food safety, smallholder farmers, Nigeria

JEL Classification: O13, Q18

1. Introduction

Food inflation increased between 2020 and 2021, as evidenced by the Food and Agriculture Organisation (FAO, 2023a; 2023b), which reports that the cost of a healthy diet increased by more than 5% in all regions except Europe and North America. It was emphasised further that in 2022, at least 3.1 billion people worldwide, equivalent to 42 percent, could not afford a nutritious meal. Agriculture's total factor productivity growth is still thriving in China and several Asian nations, but it is clearly well below target growth in the majority of nations, particularly in Sub-Saharan Africa and the US (Agnew & Hendery, 2023). Studies (e.g., Agnew & Hendery, 2023; Fuglie et al., 2024; Headey & Reut, 2023) claimed that, in order to meet the agricultural demands of a growing population, the globe must strive for 1.91%

average annual productivity increase, as opposed to the 1.14% average growth that occurred between 2011 and 2021.

Food safety ensures agricultural output, which is essential to human survival. At least 70% of Africans are employed in agriculture. Since no part of the world has become a diverse modern economy without first building a strong foundation in agriculture, it is clear from this submission that agricultural innovation is the way to wealth in Africa (Giller, 2020; Pawlak & Kolodziejczak, 2020). Nonetheless, agriculture is essential to Africa's progress and to achieving the Sustainable Development Goals, which aim to end hunger and severe poverty by 2030. Thus, the agricultural risk financing approach is the most dependable tool that farmers and agricultural producers may actively use to reduce the many risks associated with unfavourable conditions (Khan *et al.*, 2024; Komarek *et al.*, 2020).

However, research has shown that agricultural risk management is a key coping mechanism for farmers to improve their production and ability to generate money (Egbeadumah et al., 2022; Senapati, 2020; Thomas, 2018). The location of a farm, the methods used for agricultural production, the climate, and the market environment all affect the restraints that agricultural producers are susceptible to (Lencucha et al., 2020; Malhi et al., 2021). Farm risk management, on the other hand, is a combination of formal and informal methods that rely on the availability of agricultural products and fundamental limitations within a production circle. Due to limited financial activity, outdated infrastructure, lack of regulation, and restricted access to markets, low-income nations have the greatest obstacles to agricultural output (Autio et al., 2021; Komarek et al., 2020). Consequently, comprehending farmers' perceptions of and attitude toward risks and coping plans is vital in farmers' behavioural pattern, as this will aid in determining their capacities to deal with uncertainties (Huet, et al., 2020; Nwankwo & Ajemunigbohun, 2023).

Economic analysis holds a prominent position in contemporary policy discussions, and agricultural and food policy is at the heart of many urgent societal issues. Nonetheless, agricultural output is essential to human food security and sufficiency. Research (e.g., FAO, 2023c; Lencucha et al., 2020) has helped shape institutional and economic policies that drive agricultural development, participation, and output globally. Concern had been raised about the farmers' participation in agriculture and their behavioural tendencies. Numerous hazards have been linked to this worry, and several smallholder farmers in Ekiti State, Nigeria, have called for an appropriate risk financing framework to maintain food safety and management (Oluwasusi et al., 2020; Onyeaka et al., 2021).

2. Literature Review

Conceptual Issue

Agricultural Risk Financing and Food Safety - Horticulture, livestock rearing, fisheries, forestry, and other facets of crop production are all included in the applied science of agriculture (Tudi et al., 2021). In agriculture, risk refers to the likelihood of losses resulting from farmers' lack of complete control over their operations (Jankelova et al., 2017; Polycarp & Jirgi, 2018). Production, human resource, financial, market and price, and political hazards are some of the typical risks faced by the agricultural industry (Bencova & Bohacikova, 2021; Komarek et al., 2020; Mbah et al., 2023). Determining how an organisation will cover loss

events in the most efficient and economical manner is known as risk finance. Risk financing entails identifying risks, figuring out how to finance them, and keeping an eye on how well the chosen financing method is working (Saksena et al., 2014). Hernandez (2017) asserts that risks associated with funding agriculture include dangers to life, health, and property in addition to production and pricing risks. A mix of financial and physical methods are used to manage pricing risk and maximise production. Interest rates, stock prices, commodity prices, and foreign exchange rates are examples of risk factors. Because of their constant volatility, these factors affect the price of financial instruments (Nigatu et al., 2020).

Theory of Agricultural Finance

The work of Gurley and Shaw (1960) served as the foundation for the development of the theory of financial intermediation in the 1960s of the 20th centuries (Du, 2015). The agency theory and the notion of informational asymmetry serve as the foundation for the financial intermediation theory. The existence of financial intermediaries can be explained, in theory, by the following contributing factors: the high cost of transactions, the lack of timely and useful information, and the regulatory approach (Allen & Santomero, 2003; Schollens & Wensveen, 2008). The argument about informational asymmetry makes up the unique element in the studies on financial intermediation. Ex-ante, which creates the so-called problem of adverse selection; concurrently, which creates moral hazard (principal and agent relationship); or ex-post, which necessitates the use of some expensive auditing and verification procedures or even the debtor's forced execution. In an Arrow-Debreu view, the informational asymmetry leads to market imperfections and departures from the notion of perfect markets (Levchenko & Ostapenko, 2016; Meunier & Ponssard, 2022). Certain types of transaction costs emerged as a result of many of these flaws brought about by informational asymmetry. Financial intermediaries were created specifically to reduce these expenses, at least in part. According to Ozekhome and Braimah (2023), financial intermediaries are coalitions that deal with information distribution. These financial intermediaries operate as authorised representatives of savers and are capable of achieving economies of scale. As a result, individuals who accumulate savings transfer their available cash to these intermediaries so that they can be invested in to any ventures (Merrl, 2017).

Empirical Review

An international review of farmers' view on agricultural risks and associated risk management techniques was carried out in relation to a study by Duong, Brewer, Luck, and Zander (2019). It was determined that weather-related risk, biosecurity concerns, and human hazards were seen as significant risks faced by farmers in their agro-business after the study used descriptive statistics and a data reduction approach (i.e., factor analysis) from 197 studies. The study found that limited access to relevant information and official low-interest credit arrangements were the main obstacles to effectively managing agricultural hazards in underdeveloped nations. The study found differences between risk management techniques and the sources of perceived hazards. The evaluation suggested elements for further research to improve farmers' perceptions of risk exposures and, consequently, create protocols.

The willingness to pay for weather index-based insurance in Northern Togo's semisubsistence farming was investigated by Ali, Egbendewe, Abdoulaye, and Sarpong (2020). The model technique that was used is based on information collected from 704 randomly selected people in Northern Togo, West Africa. In the data analysis, a descriptive statistic was used to determine the frequency percentage. The study's findings demonstrated that the majority of impacted food crops are significantly influenced by farmers' perceived willingness. The study seek for more farmers' choices for controlling agricultural hazards, even as it offers further insights to help spread more advising activities.

A study by Shang and Xiong (2021) sought to determine the impact of farmers' risk management techniques on their readiness to adopt. The study used a structured survey to collect data from 469 individuals and had a descriptive design. A descriptive technique was used in an effort to analyse the data acquired in a conclusive manner. The study found empirical evidence that farmers' propensity to purchase insurance is significantly impacted by their limited access to information. According to the study, farmers should be given information so they can obtain insurance policies and, as a result, be more inclined to embrace insurance as the best risk management tactic.

Using empirical data from Rwanda, Ngango, Nkurunziza, and Ndigijimana (2022) evaluated rural farmers' willingness to pay for crop insurance programs. A cross-sectional survey design was used in the study, and 325 houses made up the sample size. The study's conclusions showed that while household (family) size had a negative impact on insurance premiums that farmers were willing to pay, the determinants of willingness to pay—which included formal education, income, land tenure, farm size, and farmers' access to credit—all had a positive impact. The study recommended a set of policies that may improve rural farmers' formal education and increase their involvement in crop insurance. Additionally, it recommended better access to financing for farmers in order to boost their financial capability.

The study by Bannor, Oppong-Kyeremeh, Amfo, Kuwornu, Kyire, and Amponsah (2023) focused on the connection between risk management and agricultural insurance, which is visible among Ghanaian poultry farmers. In order to analyse the data, the study used conditional logit and random parameter logit models. Certain insurance variables, such as the length of premium payments, the type of participation, the annual cost, the risk covered, and the amount covered, were taken into account during the data analysis process. According to the study's findings, farmers' formal education, farming experiences, risk covered, and premium period all positively affect their uptake of agricultural insurance, whereas price, family size, and type of participation have a negative impact.

3. Methodology

Using empirical data from Ekiti State, Nigeria, this study used a cross-sectional survey design analysis to gather smallholder farmers' opinions regarding rank-order analysis of the relationship between agricultural risk finance schemes and food safety. The premise of this survey design is that data is collected from participants in the same amount of time, which helps to remove biases from the results. This study used a survey approach backed by quantitative analysis to shed light on farmers' opinions of the choices they must make when it comes to financing agricultural risk. Over 10 million people in Nigeria are involved in smallholder farming, and this was supposed to be the study's population (Punch, 2023).

A structured questionnaire was used as the data collection tool; it was self-developed with regard to the significant concepts and variables studied; it was chosen because it was

appropriate for the chosen research design, it was economical, and it was easy to distribute (Sallies et al., 2021). The study used a double sampling technique comprised of judgemental and convenience in nature. For the judgemental sampling technique, smallholder farmers' judgements were required for thoughtful elicitation of information relating to food safety and control; for the convenience sampling method, farmers were consulted regarding their availability and readiness; for the convenience sampling method, farmers were consulted.

Construct and content validity comprised the study's validity measurement. The draft helpful research instrument used in this study for data collection was made possible by content validity, which was carried out among specialists in agriculture and agricultural risk management, while construct validity was structured in accordance with convergent and discriminant views of previous studies. As a result, for all relevant constructions, the reliability test was carried out with a Cronbach alpha higher than the typical 0.7. These final findings were consistent with the importance of internal stability and statistical intervention of the adopted scales' accuracy.

4. Results

Descriptive Analysis of Participants Responses

The examination of demographic factors and the results of the hypothesis testing are covered in detail in this section. In order to confirm or disprove the hypotheses, this step thoroughly tests the developed hypotheses and summaries the demographic factors.

 Table 1: Demographic Information of Participants

Variable	Category	Frequency (%)
Gender	Male	96 (79.3%)
	Female	25 (20.7%)
Age	18yrs but less than 30	02 (1.7%)
	30yrs but less than 40	28 (23.1%)
	40yrs but less than 50	35 (28.9%)
	50 yrs & above	56 (46.3%)
Marital Status	Single	26 (21.5%)
	Married	93 (76.9%)
	Separated	01 (0.8%)
	Widow	01 (0.8%)
Educational Qualification	SSCE/GCE	46 (38.0%)
	OND/NCE	18 (14.9%)
	HND/BSc	38 (31.4%)
	Master's Degree	04 (3.3%)
	Professional Certificate	15 (12.4%)

Source: Field Survey

Demographic variable analysis provides important information about the makeup of the group under study. Given that 79.3% of respondents were classified as male and 20.7% as female, the gender distribution shows a very balanced representation. The sample population's high gender ratio points to some gender inequality in the agriculture industry. In terms of age distribution, the data shows that the sample's age range is wide. For the most part, 46.3% of

participants are 50 years of age or older. Then came those aged 40 but under 50, who made up 28.9%; those aged 30 but under 40, who made up 23.1%; and those aged 18 but under 30 years, who made up. This distribution suggests that the sample is dominated by a comparatively older cohort. One intriguing aspect of the demographic profile is the marital status. Married people make up the majority (76.9%), while single people make up 31.5%. The lesser portions of widowed and separated make up 0.8 and 0.8, respectively. The sample population's educational backgrounds show a range of achievement levels. 38% of the population with an SSCE or GCE, followed by 31.4% with an HND or BSc, 14.9% with an OND or NCE, 12.4% with a professional certificate, and 3.3% with a master's degree.

Гab	le 2:	: Participants	' Descrip	tive In	formation
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Variable	Response Label	Response Label Frequency		
	School	23	19.0	
	Friends	16	13.2	
How do you come across agricultural	Newspapers	01	0.8	
pursuit in your life?	Online media	02	1.7	
	Others	79	65.3	
Do you think you have had adequate	Yes	8	6.6	
knowledge of agricultural risk financing techniques through which you can handle food insecurity?	No	113	93.4	
How can you scale the lavel	Low	61	50.4	
	Fair	14	11.6	
now call you scale the level	Average	31	26.4	
agricultural knowledge you have to ensure food safety?	High	09	7.4	
	Very high	05	4.1	
Can you categorise yourself as having	Yes	14	11.6	
the required risk financing skills	No	107	88.4	

Source: Field Survey

Additional information about other demographic factors can be found in Table 2. These figures provide insight into the demographics of the respondents, enabling insightful observations and conclusions. Regarding the percentage of participants who stated that they pursued their agricultural interests through other means, 65.3% said that they did so. This was followed by school (19%), friends (13.2%), online media (1.7%), and newspapers (0.8%). 93.4% of respondents said they did not know enough about smallholder farmers' agricultural risk financing strategies to address food insecurity, compared to 6.6% who suggested they did. Regarding smallholder farmers' level of agricultural commitment to food safety, the average response was 26.4%, however the bulk of responses were low (50.4%). 11.6% of responses were fair, 7.4% were high, and 4.1% were extremely high. The majority of smallholder farmers (88.4%) indicated that they did not possess the necessary risk finance skills, while only 11.6% indicated that they did. This showed that their answer varied a little.

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Table 3: Participants' Descriptive Inform	nation		
Variable	Response Label	Frequency	Percentages (%)
Have you ever had a knowledge of	Yes	75	62
agricultural insurance as a means to	No	46	38
safeguard and handle potential risks in			
agricultural production?			
In your view, as smallholders ever had the	Rarely	79	65.3
required risk retention capacity to manage	Sometimes	32	26.4
food production, safety, and control in	Quite often	10	8.3
Ekiti State	Always	00	00
In your view, is there need for agricultural	Yes	121	100
risk management education to be	No	00	00
organised for smallholder farmers to be			
able to ensure food safety and control?			
In your view, do you think risk financing	Yes	115	95.0
strategy like insurance can adequately	No	06	5.0
provide leverage for smallholders to lean			
on for the state smallholders to boost food			
production and ensure food safety?			

Source: Field Survey

Additional information on other demographic characteristics is provided by the data in Table 3. These figures enable for insightful observations and consequences by providing a window into the demographics of the survey respondents. The participants' answers about their "understanding of agricultural insurance as a way to protect agricultural output." Although 62% said "yes," 38% answered "no." Regarding "whether smallholder farmers ever possessed the necessary risk retention capacity to manage food production, safety, and control," The following percentages were recorded: rarely (65.3%), occasionally (26.4%), frequently (8.3%), and never. Regarding the percentage of participants who answered "yes," none of them indicated "no" when asked if agricultural risk management education is necessary to guarantee food safety and control. 95% of respondents inferred "yes," while 5% said "no," when asked if smallholder farmers should use risk financing strategies like insurance to increase their food supply.

Descriptive Analysis of Research Variables

Table 4 (Fig. 1) lists the agricultural risk financing strategies survey items for which data were collected from all participants: agricultural risk avoidance, agricultural risk minimisation, agricultural risk retention, agricultural insurance, and agricultural cooperative society. Participants responded to the various items, with 5.0% expressing disagreement and 95.0% indicating agreement with agricultural risk avoidance, 1.7% expressing not supporting agricultural risk minimisation, and 98.3% supporting it, 0.8% expressing disagreement, 1.7% expressing indecision, and 97.5% agreeing, and 1.6% disagreeing with agricultural insurance. Although none of the participants voiced a disagreement with this item, the agricultural cooperative society received 100% support. For every item examined, the results were corroborated by the mean and standard deviation scores. This suggests that the opinions of smallholder farmers about the survey items were centred around the mean and normally distributed. The findings of the descriptive statistics on agricultural risk financing solutions clearly suggest that, in terms of the distribution of participant judgements, all metrics have comparable opinions regarding every topic.

Table 4: Agricultural Risk Financing Strategies

	Scale Level				Mean	Std Dev.	
Variables	SD	D	U	А	SA		
	1	2	3	4	5		
Physical avoidance of agricultural risk							
occurrence in line with food safety can assist	2.5	2.5	0.0	9.9	85.1	4.73	0.806
smallholder farmers							
Minimisation of agricultural risks (such as							
provisions of new technologies, protective	0.0	1.7	0.0	11.6	86.7	4.83	0.489
wares, danger exit way, etc) can best improve							
the smallholders' abilities to agricultural							
production							
Knowledge of best risk retention techniques	0.0	0.8	1.7	11.5	86.0	4.83	0.477
(such as set aside funds, hedging, reserves,							
minor risk events, etc) can help enhanced							
smallholders agricultural drive							
Agricultural insurance can be a good strategic	0.8	0.8	0.0	16.6	81.8	4.79	0.482
tool to enhance smallholders' production							
capacities as against agricultural risks							
Agricultural cooperative societies, as a pooling							
strategy, can help as a financing technique to	0.0	0.0	0.0	40.5	59.5	4.60	0.493
upscale smallholders' capacities against							
potential farms dangers							

Source: Author's Computations

Figure 4.1: The graphical model explains the agricultural risk financing strategies among smallholder farmers in Ekiti State, Nigeria



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Table 5: Food Safety and Control Metrics

2	Scale Level				Mean	Std Dev.	
Variables	SD	D	U	А	SA		
	1	2	3	4	5		
Farmers' participations in food safety	0.8	3.3	0.8	7.4	87.6	4.78	0.701
are not encouraged in Ekiti State							
Farmers' priorities for food safety are	0.8	3.3	0.0	17.4	78.5	4.69	0.717
not encouraged in Ekiti State							
Food communication among farmers	1.7	39.6	1.7	10.7	46.3	3.60	1.440
is never strengthened in Ekiti State							
To ensure food safety in Ekiti State,	0.0	24.0	2.5	5.0	68.5	4.18	1.285
training, workshops, and seminar are,							
usually, organised among farmers							
Farmers in Ekiti State have developed	1.7	34.7	3.3	48.7	11.6	3.34	1.122
and designed measures to ensure food							
control	36.4	4.1	0.0	5.0	54.5	3.37	1.902
Food procedures for food production							
in Ekiti State cannot ensure food							
safety							

Source: Author's Computations

Figure 2: The graphical model explains the food safety and control metrics among smallholder farmers in Ekiti State, Nigeria



Food involvement, food priority, food communication, food training, food control, and food procedures were the food safety and control survey questions for which information was collected from all participants, as shown in Table 5 (Fig. 2). The participants responded to the many issues, with 95% saying they agreed, 4.1% disagreeing, and 0.8% neutral about food participation. 95.9% of participants favoured food priority, compared to 4.1% who did not. Regarding food communication, 57.0% of participants agreed, 1.7% were undecided, and 41.3% disagreed. 73.5% said they agreed with food training, 24.0% opposed, and 2.5% were unsure. Although 36.4% of responders said they did not support food control, 3.3% were unsure. 60.3% then backed it. Regarding food practices, 59.5% of individuals agreed,

compared to 40.5% who disagreed. For every item examined, the results were corroborated by the mean and standard deviation scores. This suggests that the opinions of smallholder farmers about the survey items were centred around the mean and normally distributed. It is clear from the results of the descriptive statistics on food safety and control that all the metrics have comparable opinions about every topic in the distribution of participants' opinions.

Variable Coefficients Std. Error t Sig. 2.320 11.151 (Constant) 23.715 .000 Agricultural risk financing .110 .061 1.181 .000 strategies R Square 0.133 F 3.615 0.000 Sig

Table 6: Results for Agricultural Risk Financing Strategies vs food safety control

Source: Author's Computations

It is evident from the regression analysis results in Table 6 above that agricultural risk management techniques and food safety control have a favourable association. Agricultural risk management strategies account for approximately 13.3% of the variance in food safety control, according to the model, which also displays the fluctuations experienced by the dependent variable that might be explained by the independent variable (R square). This indicates that factors other than the predictor utilised in this model (agricultural risk management strategies) account for 86.7% of the food safety control enjoyed by smallholder farmers in Ekiti State. Agricultural risk management strategies (agricultural risk avoidance, agricultural risk minimisation, agricultural risk retention, agricultural insurance, and agricultural cooperative society) account for 11.9% of the variation in food safety control, according to the generalisation of the results (Adjusted R square). Since there is not much of a difference between R Square and Adjusted R Square, this result is nearly accurate. If this model is used to create predictions in real life, the standard error fit, a gauge of the model's accuracy, illustrates how inaccurate the statistical results could be at 3%. Since the aforementioned result is below the 0.05 confidence interval utilised in this investigation, it is statistically significant, as shown in the ANOVA table (p-value = 0.000). When the F-ratio is greater than 1, it shows that the model is efficient; however, when it is 3.517, it suggests that the model is not particularly efficient.

Discussion of Findings

The hypothetical outcome showed a positively low relationship between agricultural risk management strategies and food safety control among selected smallholder farmers in Ekiti State. The aligned with earlier works of Bannor et al. (2023); Nwankwo & Ajemunigbohun (2023); and Shang and Xiong (2021); who suggested that farmers should be given information so they can obtain insurance policies, as a credible agricultural risk management strategy and, as a result, be more inclined to embrace insurance as the best risk management tactic.

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 smallholder

farmers and their related risk financing strategies in agriculture and food safety and control in Ekiti State, Nigeria. This study therefore confirmed a positive nexus between agricultural risk financing strategies and food safety and control in Ekiti State, Nigeria. In an effort to support farmers' output capacities, the agricultural insurance providers should improve and broaden their value-chain procedures. To provide more farmers access, the government should broaden the subsidy network. It is true that insurance companies should create their agriculture insurance plans in the most straightforward and palatable way possible in order to win over farmers' trust and business. In order to generate cash for agricultural cooperators to supply food and manage potential risk factors that can arise, agricultural cooperative societies should be reinforced. To enable smallholders in Ekiti State to finance their agricultural risks in a timely manner before considering transferring those risks to insurers, further trainings on risk retention techniques should be arranged.

Contributions to Knowledge and Limitations of the study

The study's contribution is evident in the rank-order analysis of agricultural risk financing techniques and food safety and control among smallholder farmers in Ekiti State, which was established within the parameters of the research space. Due to the fact that smallholder farmers in Ekiti State provided the majority of the contributions for this study, other farmers in Southwestern States were not included. Regression and correlational analysis of the variables of interest in this study can be used in future research. This research made a conceptual and methodological contribution.

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References

- Ali, E., Egbendewe, A. Y.G., Abdoulaye, T, & Sarpong, D.B. (2020). Willingness to pay for weather index-based insurance in semi-subsistence agriculture: Evidence from Northern Togo. Climate Policy, 1-14.
- Allen, F., & Santomero, A.M. (2003). *The theory of financial intermediation*. Philadelphia: Financial institution Centre.
- Angew, J., & Hendery, S. (2023). 2023 global agricultural productivity report: every farmer, every tool. Virginal Tach: College of Agriculture and Life Sciences.
- Autio, A., Johansson, T., Motaroki, L., Minola, P., & Pellikka, P. (2021). Constraints for adopting climate-smart agricultural practice among smallholder farmers in Southeast Kenya. Agricultural Systems, 194, 1-13.
- Bannor, R.K., Oppong-Kyeremeh, H., Amfo, B., Kuwornu, J.K.M., Kyire, S.K.C., & Amponsah, J. (2023). Agricultural insurance and risk management among Poultry farmers in Ghana: An application of discrete choice experiment. Journal of Agriculture and Food Research, 11, 1-12.
- Bencova, T., & Bohacokova, A. (2021). How to deal with global concept of risk in agriculture? Comparative overview of the literature. SHS Web of Conference, 92, 1-9.
- Du, X. (2015). The evolution of financial intermediary theory and the redesign of undergraduate finance course content system. *Frontier in Educational Research*,4(1), 93-96.

- Duong, T. T., Brewer, T., Luck, J., & Zander, K. (2019). A global review of farmers' perceptions of agricultural risks and risk management strategies. Agriculture, 9 (10), 1-16.
- Egbeadumah, M.O., Aboshi, E.A., & Zarewa, M.N. (2022). Agricultural risk management and production efficiency among peasant farmers in Taraba state, North Eastern, Nigeria. *Journal of Land and Rural Studies, 11* (1), 19-26.
- Food and Agriculture Organisation (2023a). *Statistical yearbook: world food and agriculture 2023*. United Kingdom: Food and Agriculture Organisation of the United Nations.
- Food and Agriculture Organisation(2023b). *The state of food and agriculture 2023 Revealing the true cost of food to transform agri-food system*. Rome: Food and Agriculture Organisation of the United Nations.
- Food and Agriculture Organisation(2023c). *Rising global food insecurity: Assessing policy response A report prepared at the request of the group of 20 (G20).* Rome: Food and Agriculture Organisation of the United Nations.
- Fuglie, K.O., Morgan, S., & Jelliffe, J. (2024). World agricultural production, resource use, and productivity, 1961 – 2020. *Report N. EIB-268*, U.S. Department of Agriculture, Economic Research Service.
- Giller, K.E. (2020). The food security conundrum of Sub-Saharan Africa. *Global Food* security, 26, 1-7.
- Headey, D., & Reut, M. (2023). Food inflation and child undernutrition in low- and middleincome countries. Nature Communication, 1-10.
- Huet, E.K., Adam, M., Giller, K.E., & Deschemaeker, K. (2020). Diversity in perception and management of farming risks in Southern Mali. Agricultural Systems, 184, 1-15.
- Jankelova, N., Masar, D., & Moricova, S. (2017). Risk factors in the agricultural sector. *Agricultural Economics*,63(6), 247-258.
- Khan, F. U., Nouman, M., Negrut, L., Abban, J., Cismas, L.M., & Siddiqi, M.F. (2024). Constraints to agricultural finance in underdeveloped and developing countries: A systematic literature review. *International Journal of Agricultural Sustainability*,22(1), 1-24.
- Komarek, A.M., Pinto, A.D., & Smith, V.H. (2020). A review of types of risks in agriculture: What we know and what we need to know. *Agricultural systems*, *178*, 1-10.
- Lencucha, R., Pal, N.E., Appau, A., Thow, A., & Drope, J. (2020). Government policy and agricultural production: A scoping review to inform research and policy on healthy agricultural commodities. *Globalisation and Health*, 1-15.
- Levchenko, V., & Ostapenko, M. (2016). Information asymmetry on the market of nonbanking financial services in Ukraine: causes, consequence, methods of control. *Public* and Municipal Finance, 5(1), 29-37.
- Malhi, G.S., Kaur, M., & Kaushik, P. (2021). Impact of climate change on agricultural and its mitigation strategies: A review. Sustainability, 13(3), 1-21.
- Mbah, L.T., Molva, E.L., Bomdzele, E., & Egwu, B.M.J. (2023). Farmers' response to maize production risks in Cameroon: An application of the critically risk matrix model. *Heliyon*, *9*, 1-21.
- Merrl, H.J. (2017). Consequence of information asymmetry on corporation risk management. *Applied Economics These*, 21.

- Meunier, G., & Ponssard, J. (2022). Green industrial policy, information asymmetry, and repayable advance. *Journal of Public Economic Theory*, *26*, 1-32.
- Ngango, J., Nkurunziza, F., & Ndigijimana, J. (2022). Assessing rural farmers' willingness to pay for crop insurance scheme: Evidence from Rwanda. Cogent Economics & Finance, 10 (1), 1-14.
- Nwankwo, S.I. & Ajemunigbohun, S.S. (2023). Assessing Farmers' Behavioural Metrics, Participatory Influences, and Demand-side Barriers of Agricultural Insurance in South-West, Nigeria. *Gusau International journal of Management and Social Scences*,6(3), 256-273.
- Oluwasusi, J. O., Adeyemo, A. O., Muhammed, M.M., & oluwasipe, B.J. (2020). Farming hazards and safety practices among food crop farmers in Ikole, Ekiti State, Nigeria. *Journal of Waste Management and Disposal*,3,1-10.
- Onyeaka, H., Ekwebelem, O.C., Eze, U.A., Onwuka, O. I., Aleke, J., Nwaiwu, O., & Chionuma, J. O. (2021). Improving food safety culture in Nigeria: A review of practical issues. *Food*, 10, 1-11.
- Ozekhome, H. O., & Braimah, A. (2023). Influence of information asymmetry, illiquidity, and transaction cost on asset price in the Nigerian exchange limited. *African Development Finance Journal*,6(2), 167-187.
- Pawlak, K. & Kolodziejczak, M. (2020). The role of agricultural in ensuring food security in developing countries: considerations in the context of the problem of sustainable food production. *Sustainability*, 12,1-20.
- Polycarp, I.M., & Jirgi, A.J. (2018). Dealing with risks and uncertainties in agriculture: Implications for Central Bank of Nigeria interventions. *CBN Bullion*, *42*(3), 49-68.
- Punch (May, 2023). Lagos government empowers 20,000 farmers with agric inputs. Retrieved from: <u>http://www.punchng.com/lagos-govt</u>
- Sallies, J.E., Gripsrud, G., Olsson, U.H., & Silkoset, R. (2021). Research methods and data analysis for business decisions: A premier using SPSS. Oslo: Springer.
- Schollens, B., & Wensveen, D.V. (2003). The theory of financial intermediation: An essay on what it does (not) explain. Venna: SUERF.
- Senapati, A.K. (2020). Evaluation of risk references and coping strategies to manage with various agricultural risk: Evidence from India. *Heliyon*,6, 1-13.
- Shang, Y., & Xiong, T. (2021). The impact of farmers' assessments of risk management strategies on their adoption willingness. Journal of Integrative Agriculture, 20 (12), 3323-3338.
- Thomas, G. (2018). Risk management in agriculture. Scotland: The Scottish Parliament.
- Tudi, M., Ruan, H.D., Wang, L., Lyu, J., Sadler, R., Cornell, D., Chu, C., & Phung, D.T. (2021). Agricultural development, pesticide application, and its impact on the environment. *International Journal of Environmental Research and Public Health*,12 (1112), 1-23.