



FARM RISKS AND MANAGEMENT STRATEGIES AMONG ARABLE CROP FARMERS IN EKITI STATE, NIGERIA

Adeleye, I. A., Obabire, I.E. and Fasuan, Y. O.

Department of Agricultural Extension and Management, Federal Polytechnic Ado –Ekiti, Ekiti State

Correspondence details: adeleyeifeolu@yahoo.com

ABSTRACT

The study examined the farm risks and management strategies among arable crop farmers in Ekiti State, Nigeria. A multistage sampling procedure was used to select 105 respondents for this study. A questionnaire was used for data collection, and the data were analysed using descriptive statistical tools, such as frequency counts and percentages. The average age was 56 years, with more than half being males (58.1%), and the majority were married (61.0%). The major sources of risk to arable crop farmers include pests and diseases (100%), erratic rainfall (100%), high cost of inputs (98.1%), low produce prices (97.1%), and inadequate soil nutrients (97%). Farmer's attitude to risk management in crop production shows that the majority (92.4%) of the farmers do not adopt crop insurance in their crop practice, 97.1% engage in the planting of profitable crops, and 89.5% practice mixed cropping. The major risk management strategies adopted by arable crop farmers include selecting low and reliable risk enterprises ($\bar{x}=1.98$), diversification to reduce the impact of risk ($\bar{x}=1.92$) and adoption of production inputs that ensure better quality and quantity of farm products ($\bar{x}=1.90$). The results, therefore, call for policies aimed at encouraging financial institutions to collaborate with insurance companies to insure agricultural credit facilities in order to indirectly insure crop farms due to the inevitable risk involved in the food crop farming business. There is a need to encourage farmers to insure their farms and products against uncertain events. Banks and financial NGOs, as well as the government's Poverty Alleviation Fund programme, are encouraged to strengthen the provision of credit assistance to food crop farmers to enable them to adopt the most efficient practices to increase produce beyond subsistence level. Farmers are encouraged to form cooperatives to help manage marketing-related problems

Keywords: Farm risks, Smallholder, Management strategies, Risk behaviour, Small scale, Arable crops

I. INTRODUCTION

Agriculture employs about two-thirds of Nigeria's total labour force, contributes 42.2% of Gross Domestic Products (GDP) and provides 88% of non-oil earnings (Yakubu & Akanegbu, 2015). Agriculture can be said to be the mainstay of many economies, and it is fundamental to a nation's socioeconomic development because it is a major element and factor in national development (Olaoye, 2014). Agricultural growth in Nigeria is hindered by low productivity, diversification on a production and consumption basis, as well as a shrinking agrarian land base due to urbanisation. These hindrances persist due to factors like unpredictable weather conditions and price uncertainty. However, investing in Agriculture, like many other economic activities, is exposed to a wide variety of risks ranging from input supply and prices, agricultural yield, postharvest losses and product prices to the vagaries of nature such as inclement weather conditions, pests and diseases (Ajiboye & Adebayo, 2020). Other natural hazards, such as floods and fire outbreaks, are equally important with regard to their impact on the success or failure of an agricultural enterprise.

(Ojo & Akinbode, 2019).defined risk as an uncertainty that affects an individual's welfare and is often associated with adversity and loss. Smallholder arable crop farmers face many risks in their farming activities, which hinder them from pursuing their farming as a business. The risk situation is made worse by the fact that the farmers operate in an environment with weak markets and lack access to sufficient support institutions that can assist the farmers to cope with risks. Several studies identified production risk, marketing risk, financial risk, institutional risk, and human risk as the major sources of risk in agricultural production (Adeola & Ayoade, 2021; Ndem and Osondu, 2018). Production risk originates from adverse weather conditions, insects, diseases, technology and any other events that directly affect production quantity and quality. Marketing risk emanates from uncertainty in the market for commodities, such as fluctuations in output and input prices. Financial risk revolves around the method of acquiring and financing capital and a farmer's ability to pay financial obligations. Institutional risk arises from changes in government and/or legal policies and standards that affect agriculture. Human risk emanates from man. The risk could be due to labour shortage, ill health, death, divorce, injury, fire outbreak, burglary or theft. (Ozor & Cynthia, 2021) opined that risk occurs in agriculture because agriculture is contrived with many challenges, most of which are beyond the farmer's control. (Okoye, Agwu, & Ukoha, 2020) enumerated these challenges to include climate variability, input price variability, technology change, theft, insecurity, incidence of pests and diseases, equipment breakdown, high cost of veterinary services, change in government policy,

borrowing money with sudden change in interest rates, scarcity of labour at peak time and change in health and wellbeing of the farmers. These factors make small-scale farmers inadequately equipped against risks and uncertainties (Oladimeji, Abdulsalam, & Abdullahi, 2020).

Risks are completely unavoidable in agriculture. Farmers must consistently adopt some measures to mitigate the effects of risk on their farming enterprise. Risk management, according to the United States Department of Agriculture (2016), involves making selections among alternatives that mitigate the economic consequences that can result from risks and uncertainties. In recent years, several researchers (Salimonu and Falusi, 2012); OECD (2013; Cervantes-Godoy *et al.*, 2013; World Bank, 2013) have carried out studies on risk management strategies amongst farmers. To reduce the effects of risk or survive in poor conditions for farm activities, it is necessary to use risk management strategies. Farmers usually adopt several strategies, some of which, Ozor & Cynthia (2021) categorised as choosing a reliable enterprise, diversification, intercropping, irrigation, pest control, sale of assets, money lending and engaging in non-farm work. According to Abdullahi & Oladimeji (2020), attitudes to risk are often related to the financial ability of the farmer to accept a small gain or loss. Farmers differ in the degree to which they accept risk. Some farmers are willing to accept more risk than others. Farmers' attitudes may be classified as: risk-averse (those who try to avoid taking risks), risk-takers (those who are open to riskier business options), and risk-neutral (farmers who lie between the risk-averse and risk-taking position). In this study, therefore, the parameters employed to investigate farm risks and management strategies adopted by arable crop farmers in Oye Local Government Area of Ekiti State, Nigeria were as follows; to describe the socio-economic characteristics of the respondents, to identify the major sources of risk to agricultural production, to determine the arable crop farmers attitudes to risk management and to identify the risk management strategies adopted by the small-scale farmers in the study area.

II. METHODOLOGY

Study area

This study was conducted in the Oye-Ekiti Local Government Area of Ekiti State, Nigeria. Oye-Ekiti is one of the 16 Local Government Councils of Ekiti state, the southwest geopolitical zone of Nigeria. Oye-Ekiti lies between the latitude 7° 47'–52.55' N and longitude 5° 19'–42.78° E. The area is characterised by a hot season which lasts for about 2.6 months from January 23 to April 9. It has an average daily temperature of 88°F with average rainfall of 187.89mm and approximately 15 rainy days in a month. It has its driest month in December. Oye local government is bounded by Ilejemeje local government to the North, Irepodun/Ifelodun to the

South, Ikole local government to the East and Ido/Osi local government to the West. According to recent statistics, Oye-Ekiti has a population of approximately 48,545, comprising 24,595 males and 23,950 females (NPC and NBS, 2020).

Aside from the Federal University and local Government headquarters that are in Oye-Ekiti, which have civil and public servants, the majority of the residents in Oye-Ekiti are farmers. Oye local government area comprises five (5) districts, and the following towns and villages: Oye Ekiti, Ilupeju, Ayegbaju, Ire, Itapa, Imojo, Ilafon, Isan, Ilemeso, Omu, Ijelu, Oloje, Egbu, Iyemero, Omuo-odo, Ojuola, Olomolowa, Aba Oke, Aba Opomo, Okeiyin, Elewuro, and a host of others. There are varieties of Agricultural products in the local government area. Prominent among the cash crops are: cocoa, timber, cashew, kolanut, cassava, rice, plantain, yam, banana, oranges, coconut, walnuts, etc.

Sampling procedure and sample size

A multistage sampling procedure was used in selecting the respondents in the study area. In the first stage, one Local Government Area was selected randomly out of the 16 Local Governments in Ekiti State. In the second stage, five (5) communities were randomly selected from the list of communities in the study area, which were Itapa, Ilupeju, Iyemero, Isan, and Elewuro. Finally, at the third stage, a random sampling was employed in selecting twenty-one (21) small-scale arable crop farmers from each of the communities. In total, 105 farmers were randomly selected for the study.

Method of data analysis

Descriptive statistics such as frequency counts, percentages and mean values were used to identify the major sources of risks facing the arable crop farmers and risk management strategies adopted by the arable crop farmers.

A three-point Likert-type scale was used to measure the farmers' attitude towards risk management. The farmers were asked questions graded on a 3-point scale; the responses were graded according to Positive, Negative and Neutral. The responses were given scores of 3, 2, and 1, respectively.

III. RESULTS AND DISCUSSION

Socio-economic characteristics of respondents

Table 1 presents a summary of the results on socio-economic characteristics of the respondents in the study area. The result reveals that the majority (63.8%) of the respondents are within the age bracket of 40 – 59 years old, with the mean age of the sampled respondents being 56 years.

This implies that the respondents were relatively old. This result corroborates the findings of Ndem and Osondu (2018) that farmers' taking ability decreases with age. The table also shows that a little above half (58.1%) of the arable crop farmers were male. This shows that males are more involved in farming in the study area than females. It may also be that male farmers adopt more risk mitigation strategies in arable crop cultivation of crop as shown in the study. The majority (60.0%) of arable crop farmers in the study area were married, while 1% of the arable crop farmers were single. This indicates that a greater percentage of the farmers were married and may therefore be willing to adopt risk mitigation strategies that would reduce losses of their farm produce. The mean year of farming experience of about 21 years is an indication that the arable crop farmers are well experienced in the farming business and have a better understanding of the system, conditions, trends, terrains, prices and risks inherent in arable crop farming. This result agrees with Adebayo & Olorunsanya (2019) that experience reduces management risk. In terms of education, 37.1% of the arable crop farmers attained a primary school level of education, while 21.9% had secondary school education, and 9.5% had tertiary education. This indicates that more farmers in the study area were literate; therefore, they can accept innovations and adoption strategies to avert risk in arable crop production. This agrees with the findings of Adepoju and Salau (2017). The mean household size of the respondents was 7 people. This implies that the majority of the respondents had a small household size and may need to hire labour to work on the farm. The results also showed that farmers in the study area have an average farm size of 3 ha. This is in line with the findings of Aliyu and Yusuf (2021), who recorded average farm sizes of 2.8 ha and 2.5 ha in Niger and Kogi States, respectively. The size of a farm is very crucial in agriculture since it largely determines the output of a farmer. This contrasts with the results of Afolabi and Adegbite (2020), who found that small farm sizes did not significantly limit productivity in some regions. The majority of the farmers (61.9%) belong to a farmers' cooperative. Just about 38.1% were not members of cooperatives. Farmers' membership in cooperatives gives them the advantage of enjoying economies of scale due to collective bargaining power. Ogunyomi and Afolami (2021) also noted that cooperative membership helps farmers mitigate risks and uncertainties, thereby improving their efficiency.

Table 1: Socio economic characteristics of the respondents

Socio-economic variables	Frequency	Percentage	Mean
Age			
40 – 49	30	28.6	56
50 – 59	27	35.2	
60 – 69	22	21.0	
70 – 79	16	15.2	
Gender			

Male	61	58.1	
Female	44	41.9	
Marital Status			
Single	1	1.0	
Married	64	61.0	
Divorced	16	15.2	
Widow/Widower	24	22.9	
Farming Experience			
1 – 10	23	21.9	
11 – 20	40	38.1	21
21 – 30	23	21.9	
31 – 40	13	12.4	
41 and above	6	5.8	
Educational Status			
No formal education	33	31.4	
Primary education	39	37.1	
Secondary education	23	21.9	
Tertiary education	10	9.5	
Household size			
1 – 5	37	35.2	
6 – 10	53	50.5	7
11 and above	15	14.3	
Farm size			
1 – 3	66	62.9	3
4 – 6	39	37.1	
Farm acquisition			
Inheritance	17	16.2	
Rent	23	21.9	
Gift	7	6.7	
Family	44	41.9	
Purchased	14	13.3	
Membership of Cooperative			
Yes	65	61.9	
No	40	38.1	

Source: Field survey, 2025

Major Sources of Risks to Arable Crop Farmers

The major sources of risks to arable crop farmers in the study area are presented in Table 2. Agricultural risks are divided into five. It can be observed that production and technical risk are the major risks being faced by the respondents in the study area. The risks under production and technical risk are pests and disease, and erratic rainfall, with 100% affirmation, while inadequate soil nutrients had 97% affirmation. These risks could have a negative effect on the output as well as the income realised by the farmers. This result is similar to the findings of Egbetokun and Omonona (2019), who reported that the major causes of farm losses were pest and disease outbreaks, erratic rainfall patterns, and theft. Also, marketing risks such as high input costs (98.1%) and low produce prices (97.1%) were affirmed as significant sources of risk. The major financial risks to the farmers were a lack of access to loans, with 74.3% affirmation, high

interest rates, with 58.1% and a lack of insurance, with 75.1% affirmation, as sources of risk in the study area. Access to a loan could help the farmers expand their farm business, increase their incomes and change their attitudes towards risk. Insurance coverage is also a way of mitigating the effects of risks on farm business, and its lack could be attributed to the high cost and bureaucracy involved in acquiring agricultural insurance coverage. Ndem and Osondu (2018) reported that a lack of adequate insurance coverage implies that farmers do not have formal security against unforeseen circumstances on their farms. Another source of risk in the study area is institutional risk, and this includes government policies (58.1%), agricultural loans and subsidies (37.1%) and ineffective extension services (54.3%), affirmation as a source of risk. Human and Personal risks include theft, ill health and labour shortage. The percentage of affirmation as sources of risk to agricultural production in the study area is 96.2%, 96.2% and 94.3% respectively.

Table 2: Major Sources of Risk Faced by the Respondents in the Study area

Sources of Risk	Frequency	%
Production and technical risk		
• Pest and Diseases	105	100
• Erratic rainfall	105	100
• Inadequate soil nutrients	102	97
Marketing Risk		
• High cost of Input	103	98.1
• Low produce price	102	97.1
Financial Risk		
• Lack of access to loan	78	74.3
• High interest rate	61	58.1
• Lack of Insurance	79	75.2
Institutional Risk		
• Government Policies	61	58.1
• Agric Loan and Subsidies	39	37.1
• Ineffective extension services	57	54.3
Human and Personal Risk		
• Theft	101	96.2
• Ill health	101	96.2
• Labour Shortage	99	94.3

Source: Field survey, 2025

Attitudes of the Arable Crop Farmers' toward Risk Management

Table 3 depicts farmers' attitudes to risk management in agricultural production in the study area. The table shows that the majority (92.4%) of the respondents do not adopt crop insurance in their agricultural practice. 37.1% of the respondents always adopt new technology in their farming practice, while 25.7% do not adopt new technology. The table also revealed that 75.2% of the respondents engage in both rain-fed and dry-season farming, while 44.8% engage in

animal rearing to complement the source of income and reduce risk. Furthermore, 89.5% practice mixed cropping, while 97.1% engage in the planting of profitable crops to reduce production and technical risk in their agricultural production system. 62.9% engage in other jobs with farming as their secondary job with the aim of reducing risk shock in their farm business, as 75.2% enjoyed credit facilities from the various cooperative societies they belong to help them during farming activities. 58.1% do not have access to extension services to help them understand agricultural risk, while 79.0% use pesticides insecticides to reduce risk in their farms. These findings are consistent with those of Ogunniyi et al. (2020), Oladimeji and Abdullahi (2021), and Adepoju and Salau (2017), who reported similar trends in Nigerian farmers' risk management practices, including low adoption of crop insurance, limited access to extension services, mixed cropping, income diversification, cooperative support, and pesticide use.

Table 3: Distribution of Respondents by their Attitudes towards Risk Management

S/No	Farmers Attitude to risk management	%		
		Positive	Neutral	Negative
1.	Adoption of farm Insurance	2.9	4.8	92.4
2.	Adoption of New Technology	37.1	37.1	25.7
3.	Engagement in both rain-fed and dry season farming	75.2	18.1	6.7
4.	Engagement in animal rearing to complementing income	26.7	28.6	44.8
5.	Practice mixed cropping	89.5	6.7	3.8
6.	Engage in crop(s) that is profitable	97.1	2.9	0.0
7.	Engage in other job(s) apart from farming	62.9	23.8	13.3
8.	Enjoy credit facilities from cooperative/banks	16.2	8.6	75.2
9.	Access to ADP Extension agents	36.2	5.7	58.1
10	Use of insecticide/pesticide in my farm	79.0	21.0	0.0

Source: Field survey, 2025

Risk Management Strategies Adopted by the Arable Crop Farmers

Table 4 depicts risk management strategies adopted by arable crop farmers in the study area. The result shows that taking an insurance policy to protect compensation, with a mean value of 1.98, ranked 1st, while access to a life assurance policy was ranked 2nd with a mean score of 1.92. Among the risk strategies, access to health insurance scheme (mean score = 1.90) was ranked 3rd, while community assistance to farmers and benefits from cooperative in terms of volume sale, sharing transport cost, etc. We were ranked 4th with a mean score of 1.72, respectively. Selling and leasing of assets for cash as extra income was ranked 6th with a mean score of 1.71, while assistance from associations and groups was ranked 7th with a mean score of 1.54. Storage of crops after harvest and selling when prices are high was ranked 8th, and engagement in

contractual arrangements where buyer and producer agree on quantity, quality and price in advance of delivery, as well as holding assets that can be converted into cash to meet cash demand, was ranked 9th with mean values of 1.53 and 1.5,2 respectively. Selling directly to final consumers to enhance profitability, diversification to reduce impact of risk, Selecting low and reliable risk enterprise, employment of skilled and experienced labour, and Adoption of production inputs that ensure better quality and quantity of farm products was ranked 11th, 12th, 13th, 14th and 15th respectively with mean values of 1.43, 1.30, 1.15, 1.06 and 1.01 as risk strategies adopted by small-scale farmers in the study area. These findings align with the studies by Ogunniyi et al. (2020), Oladimeji and Abdullahi (2021), and Adeyemo et al. (2019), who observed that small-scale farmers commonly adopt a combination of financial, institutional, and farm-level strategies such as insurance, cooperative benefits, asset management, diversification, and market engagement to manage risk and improve resilience.

Table 4: Distribution of Respondent by Risk Management Strategies

Risk Strategy adopted	Mean	Ranking
Selecting low and reliable risk enterprise	1.98	1 st
Diversification to reduce impact of risk	1.92	2 nd
Adoption of production inputs that ensure better quality and quantity of farm products	1.90	3 rd
Community assistance when faced with problems.	1.72	4 th
Cooperative providing members with benefit of volume sales, sharing transport and reduce cost, purchasing input collectively to reduce cost, etc.	1.72	4 th
Engage in selling and leasing assets for cash and renting assets for extra income	1.71	6 th
Groups/associations assistance for credit mobilization, timely delivery of services and provision of inputs and marketing	1.54	7 th
Storage of crops after harvest and selling when prices are high	1.53	8 th
Engagement in contractual arrangements where buyer and producer agree on quantity, quality and price in advance of delivery	1.52	9 th
Assets holding that can be converted into cash to meet cash demand	1.52	9 th
Selling directly to final consumers to enhance profitability.	1.42	11 th
Access to life assurance policy for farm owners	1.30	12 th
Access to insurance policy to provide protection in the form of compensation to offset harvest failure	1.15	13 th
Employment of skilled and experienced labour	1.06	14 th
Access to Health insurance scheme	1.01	15 th

Source: Field survey, 2025

IV. CONCLUSION AND RECOMMENDATIONS

This study showed that farmers in Oye Local Government Area who grow crops face many risks, mostly from pests, diseases, unpredictable rain, and changes in the market. To deal with these risks, most farmers use informal methods like mixed cropping, farming in the dry season, and joining a cooperative. But not many people use formal risk tools like insurance and extension services. Farmers have different attitudes towards risk, and many are risk-averse because they don't have a lot of money. Experience and working together help them become more resilient. Insurance, diversification, and health assurance are some of the most important risk strategies. Managing risk well depends a lot on your level of education and how easy it is to get credit. Institutional support is not strong enough and needs to be improved right away. Policies should encourage education, funding, and risk awareness to make people more resilient. Farmers will be better able to handle agricultural risks if they have better support systems. It is recommended that the farmers should be encouraged to adopt more risk mitigation measures on their farms. Also, the interventions of government aimed at boosting farming income and reducing various forms of farming risk would encourage the farmers in their production activities. Techniques, skills and methods which could assist in reducing the incidence of risk on larger farm should be introduced to the farmers through research and extension services.

References

- Abdullahi, A., & Oladimeji, Y. U. (2020). Determinants of risk attitudes among smallholder farmers in Nigeria: Evidence from the North Central region. *African Journal of Agricultural Economics and Rural Development*, 8(4), 75–83.
- Adebayo, O. O., & Olorunsanya, E. O. (2019). Effect of farmers' experience on risk perception and management strategies in agricultural production in Nigeria. *Nigerian Journal of Agricultural Economics*, 9(1), 112–120.
- Adeola, R. G., & Ayoade, A. R. (2021). Assessment of risk sources and management strategies among smallholder farmers in Nigeria. *Nigerian Journal of Agricultural Economics*, 11(1), 45–54.
- Adepoju, A. A., & Salau, S. A. (2017). Impact of farmers' education on the adoption of agricultural technologies in Nigeria: Evidence from rural farming communities. *Journal of Agricultural Extension*, 21(3), 65–77. <https://doi.org/10.4314/jae.v21i3.6>
- Adeyemo, R., Oke, J. T. O., & Akinola, A. A. (2019). Risk management strategies adopted by arable crop farmers in Osun State, Nigeria. *Nigerian Journal of Agricultural Economics*, 9(2), 34–45.

- Afolabi, J. A., & Adegbite, A. A. (2020). Farm size and productivity among smallholder farmers in Southwest Nigeria: Evidence from maize-based farming systems. *Journal of Agricultural Extension and Rural Development*, 12(3), 45–52. <https://doi.org/10.5897/JAERD2020.1134>
- Ajiboye, A. O., & Adebayo, O. O. (2020). Risk and uncertainty in agricultural investment in Nigeria: Challenges and policy implications. *African Journal of Agricultural Economics and Rural Development*, 8(2), 117–125.
- Aliyu, R. O., & Yusuf, S. A. (2021). Farm size and productivity of smallholder arable crop farmers in North Central Nigeria. *Nigerian Journal of Agricultural Economics*, 11(2), 89–97.
- Cervantes-Godoy, D., Kimura, S., & Antón, J. (2013). *Risk management in agriculture in Spain*. OECD Food, Agriculture and Fisheries Papers, No. 60. OECD Publishing. <https://doi.org/10.1787/5k3xq8v55232-en>
- Egbetokun, O. A., & Omonona, B. T. (2019). Risk perception and coping strategies among small-scale crop farmers in Southwest Nigeria. *African Journal of Agricultural and Resource Economics*, 14(4), 302–312.
- National Population Commission & National Bureau of Statistics. (2020). *Population distribution by sex, state, LGA, and senatorial district: 2020 estimates*. Abuja, Nigeria: NPC & NBS.
- Ndem, M. U., & Osondu, C. K. (2018). Risk and uncertainty in agribusiness in Nigeria: A review of literature. *International Journal of Agriculture and Earth Science*, 4(1), 29–36
- Ogunniyi, L. T., Olapade-Ogunwole, F. A., & Omotesho, K. F. (2020). Farmers' willingness to pay for agricultural insurance and its determinants in Nigeria. *Journal of Agricultural Extension and Rural Development*, 12(4), 54–62. <https://doi.org/10.5897/JAERD2020.1132>
- Ogunyomi, A. I., & Afolami, C. A. (2021). Effect of cooperative membership on risk management and technical efficiency of smallholder farmers in Nigeria. *Journal of Cooperative Organisation and Management*, 9(1), 100128. <https://doi.org/10.1016/j.jcom.2021.100128>

- Ojo, M. A., & Akinbode, S. O. (2019). Perceived sources and effects of production risk on arable crop farmers in Nigeria. *Journal of Agricultural Extension and Rural Development*, 11(6), 106–113. <https://doi.org/10.5897/JAERD2019.1045>
- Okoye, B. C., Agwu, A. E., & Ukoha, O. O. (2020). Perceived risks and risk management strategies among smallholder farmers in Nigeria. *African Journal of Agricultural and Resource Economics*, 15(1), 45–58.
- Oladimeji, Y. U., & Abdullahi, A. (2021). Assessment of risk sources and coping strategies among small-scale crop farmers in North Central Nigeria. *Journal of Development and Agricultural Economics*, 12(2), 85–94. <https://doi.org/10.5897/JDAE2020.1164>
- Oladimeji, Y. U., Abdulsalam, Z., & Abdullahi, A. (2020). Assessment of risk sources and coping strategies among small-scale crop farmers in North Central Nigeria. *Journal of Development and Agricultural Economics*, 12(2), 85–94. <https://doi.org/10.5897/JDAE2020.1164>
- Olaoye, T. (2014). Sustainable agriculture and national development in Nigeria. *Journal of Emerging Trends in Economics and Management Sciences*, 5(5), 372–377.
- Organisation for Economic Co-operation and Development (OECD). (2013). *Risk management in agriculture: What role for governments?* OECD Publishing. <https://doi.org/10.1787/9789264116146-en>
- Ozor, N., & Cynthia, A. O. (2021). Understanding risk exposure and management among rural farmers in Nigeria. *Journal of Agricultural Extension*, 25(3), 55–66. <https://doi.org/10.4314/jae.v25i3.6>
- Salimonu, K. K., & Falusi, A. O. (2012). Sources of risk and management strategies among food crop farmers in Osun State, Nigeria. *African Journal of Agricultural Research*, 7(25), 3627–3633. <https://doi.org/10.5897/AJAR11.1945>
- United States Department of Agriculture. (2016). *Risk management: Why it is important*. USDA Risk Management Agency. <https://www.rma.usda.gov/en/Topics/Risk-Management>
- World Bank. (2013). *Agricultural risk management in Africa: A review of World Bank projects*.

Agriculture and Environmental Services Discussion Paper No. 8.
World Bank Group.

<http://documents.worldbank.org/curated/en/460741468193770972/Agricultural-risk-management-in-Africa-a-review-of-World-Bank-projects>

Yakubu, A. T., & Akanegbu, B. N. (2015). Agriculture and its contribution to the Nigerian economy. *Journal of Economics and Sustainable Development*, 6(18), 36–44.

© GSJ