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Risk Mitigation and Agricultural Investment of Agricultural Cooperative Societies in Ekiti State, Nigeria

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ABSTRACT

The study examined effect of risk mitigation and agricultural investment in Ekiti State, Nigeria during the period 2006 - 2022. The specific objective of the study is to examine the relationship between preventive strategy and agricultural investment, and coping strategy on agricultural investment in Ekiti State, Nigeria. This study adopted descriptive research design using the questionnaire as its major instrument in amassing data in the study. The population consisted of fifteen thousand six hundred and seventy-three registered Agricultural Cooperative Societies in Ekiti State. The total sample size used in the study was 190 respondents gotten from Taro Model. One hundred and ninety questionnaires were administered to all the selected farmers for the study. The stratified sampling technique was used in selecting one hundred and ninety farmers of poultry farmers in Ekiti State, Nigeria. The inferential statistics used was correlation and simple regression analysis. The result showed that preventive strategy and agricultural investment (r[100]=0.000, p>0.05) and preventive strategy are (t = 35.850, p= 0.000). The study concluded that there is significant relationship between preventive strategy and agricultural investment in Nigeria while coping strategy exerts positive significant effect on agricultural risk in Nigeria.

Keywords: Risk Mitigation, Agricultural Investment, Preventive Strategies, Coping Strategies.

1.0 INTRODUCTION

Considering Nigeria's populous nature and the dominance of a significant portion of its population in the rural areas as well as the relatively large land mass it maintains, it suggests that agriculture may be a precursor for human development and the prosperity of the economy. Albeit, agriculture is a highly risky economic activity particularly where

small-scale farmers are exposed to numerous heights of risks associated with ecological, political, production and market environment, amongst others (Polycarp & Jirgi, 2018). Even though risk is two-edged; that is, it has its adverse as well as its favourable aspects, yet, it is unarguable that a continuous shoot up in price of crops and livestock could proffer market and investment opportunities. Similarly, fall in prices may create certainty for agricultural business and encourage investment but same may distort profit at the point of sale, discourage investment, cause assets to remain in a bad state and make farmers less desirable to financial institutions in terms of loan offer. In effect, farmers in their bid to reduce and in some case avoid risk tend to reduce their investment in contemporary agricultural methods which includes the adoption of preventive, mitigating and coping risk strategies to salvage the height of risk that is inherent in agricultural business.

The business of agriculture has been identified as being characterised with several major risks which farmers stumble on in the course of production and they include marketing risk, institutional risk, human risk and production risk (Ndem & Osondu, 2018). Production risk stems from the unfavourable weather condition, diseases, insects, technological changes. Again, marketing risks originate from the uncertainty that is associated with the price of agricultural inputs. Furthermore, financial risk concerns the approach of acquiring and providing fund as well as the farmers' ability to meet their financial obligations. In a similar way, institutional risks are caused by instability of government or legal policies which occasions change in the mode of operation by farmers in the agricultural sector. More importantly, human risk originates from human; this particularly describes the damage caused by Fulani herdsman on farmlands, fire outbreak, theft and labour shortage (Aminu, Balogun & Oke, 2018). Jirgi (2013) maintained that a lot of risk is inherent in the business of agriculture which is premised on the several challenges that are related with agriculture which are often beyond the control of most farmers.

In mitigating these risks, satisfactory risk perception is critically important in selecting effective risk management strategy; this is very necessary as a farmer is expected to in more than an average capacity manage risk effectiveness, get acquainted with contemporary risk factors and possess knowledge and risk management skills that will aid the identification and mitigation of these problems (Adeyonu, Otunaiya, Oyawoye & Okeniyi, 2021).

In the course of time, agricultural entrepreneurs have been bedeviled by increasing challenges and following the nature of the economy, ecology and environment of the country, varying risks threaten the survival of agricultural businesses and notwithstanding the height of risk aversion and safety first rule adopted by these business owners, their investment tends to generate an output that falls short of the standard hence cascading the confidence of investors and stakeholders in the business of agriculture (Akinola, 2014). Notwithstanding the height of risk inherent in the business, farmers and agricultural business owners have failed to deploy useable and effective risk mitigation strategies which have exposed their businesses to threats from pests, relatively poor performing breeds, low

weight gain or feed conversion, feeding and management problems; this has per time cause continuous variation and fall in productivity, hence suggesting that the processes of risk management have not been adequate, thus adversely affecting the level of investment in agriculture (Pender, 2001 in Akinola, 2014).

Premised on the above, investment in agriculture has cascaded thereby occasioning food crisis in some parts of Nigeria. This has attracted the awareness of the nation as the risks faced by farmers and the challenges and adverse situations it poses have caused more harm than good. In the bid to bring this issue to fore, several studies have been carried out across countries; however the approaches or strategies that could be harnessed to attenuate the risks existing in agricultural business was not explored, but rather the nature of risks were almost overemphasised with no identified strategy to tackle these risks and encourage agricultural investment in Nigeria (Adeyonu, Otunaiya, Oyawoye & Okeniyi, 2021; Sapkota, 2021; Ebile, Ndah & Wunsche, 2021; Owoeye, Ojo, Odewale & Adeyemi, 2020; Mesike, Ibikunle and Eboigbe, 2019; Lipińska, 2016; Onubuogu & Esiobu, 2016).

Another strand of studies explored the socio-economic characteristics that affect the risk perception of agricultural investors and ignoring deployable risk management strategies (Ibeagwa, Ehirim, Ben-Chendo, Ukoha, Osuji, Madubuike, Okwara & Martins, 2019; Aminu, Balogun & Oke, 2018). The theory underpinning the work is financial liberalisation theory which outlines the role of government intervention in the financial markets as a major constraint to savings mobilisation, investment, growth and attenuation of risk in all sectors especially the agricultural sector. The study also looks at the risk mitigation proxy with preventive and coping strategy. It is based on this backdrop that this study assesses the risk mitigation and agricultural investment of Agricultural Cooperative Societies in Ekiti State, Nigeria.

1.1 Statement of the Problem

In the course of time, agricultural entrepreneurs have been bedeviled by increasing challenges and following the nature of the economy, ecology and environment of the country, varying risks threaten the survival of agricultural businesses and notwithstanding the height of risk aversion and safety first rule adopted by these business owners, their investment tends to generate an output that falls short of the standard, hence cascading the confidence of investors and stakeholders in the business of agriculture. Notwithstanding the height of risk inherent in the business, farmers and agricultural business owners have failed to deploy useable and effective risk mitigation strategies which has exposed their businesses to threats from pests, relatively poor performing breeds, low weight gain or feed conversion, feeding and management problems; this has per time cause continuous variation and fall in productivity, hence suggesting that the processes of risk management have not been adequate, thus adversely affecting the level of investment in agriculture.

In this regard, investment in agriculture has cascaded, thereby occasioning food crisis in some parts of Nigeria. This has attracted the awareness of the nation as the risks faced by farmers and the challenges and adverse situations it poses have caused more harm than good. However, the approaches or strategies that could be harnessed to attenuate the

risks existing in agricultural business was not explored, but rather the nature of risks were almost overemphasised with no identified strategy to tackle these risks and encourage agricultural investment in Nigeria. Hence, the study also looks at the risk mitigation proxy with preventive and coping strategy. It is based on this backdrop that this study examines the risk mitigation and agricultural investment of agricultural cooperative societies in Ekiti State, Nigeria.

1.2 Hypotheses

The following hypotheses were tested in the study.

H_{01}: There is no significant relationship between preventive strategy and agricultural investment of agricultural cooperative societies in Ekiti State

H_{02}: Preventive strategy will not significantly influence agricultural investment of agricultural cooperative societies in Ekiti State

H_{03}: There is no significant relationship between coping strategy and agricultural investment of agricultural cooperative societies in Ekiti State

H_{04}: Coping strategy will not significantly influence agricultural investment of agricultural cooperative societies in Ekiti State

2.0 LITERATURE REVIEW

2.1 Agricultural Investment

Agricultural investment refers to the allocation of financial resources, expertise, and technology into the agricultural sector for the purpose of enhancing productivity, sustainability, and overall growth. This investment can take various forms, including funding for purchasing land, modernising equipment, improving irrigation systems, and providing education and training to farmers. According to Akinola (2014), investing in agriculture, individuals, governments, and organisations aim to achieve several objectives; supports the development of this essential industry, which is crucial for food security and the livelihood of millions; promotes innovation and the adoption of advanced farming practices, such as precision agriculture and sustainable farming methods; and increased crop yields and improved livestock production, ultimately boosting economic growth and reducing poverty in rural areas. Furthermore, agricultural investment can have a positive environmental impact, as it can facilitate the adoption of eco-friendly farming techniques and reduce the negative effects of agriculture on ecosystems. This, in turn, contributes to a more sustainable and resilient food system in the face of global challenges such as climate change.

Categories of Investment by Agricultural Cooperative Societies

Agricultural cooperative societies according to Falana (2019), invest in the following categories of activities in the agricultural sector with the aim of increasing agricultural productivity, improving the quality of agricultural products, and achieving

long-term sustainable growth in the industry. This type of investment can take various forms, including:

1. **Capital Investment:** Funding for purchasing land, machinery, equipment, and infrastructure to enhance agricultural operations.
2. **Technological Investment:** Investing in advanced farming technologies, such as precision agriculture, genetically modified crops, and irrigation systems, to optimise crop yields and resource efficiency.
3. **Research and Development (R&D):** Funding scientific research and development projects to create innovative agricultural practices, crop varieties, and pest control methods.
4. **Infrastructure Development:** Building roads, storage facilities, and distribution networks to support the efficient movement of agricultural products to markets.
5. **Human Capital Investment:** Providing training and education to farmers and agricultural workers to improve their skills and knowledge in modern farming techniques.
6. **Financial Instruments:** Investing in agricultural businesses through stocks, bonds, or other financial instruments related to the agricultural sector.

2.2 Risk in Agriculture

Risk can be defined as imperfect knowledge where the possibilities of the possible outcomes are known, and uncertainty exists when these possibilities are not known (Hardaker, et al, 1991); as long as agriculture remains a source of livelihood to keep the nation, these risks and uncertainties cannot be totally avoided. Agriculture has been the provider of food for the teeming population and the largest employer of the country (Amaza, 2000). Sources of risks and uncertainties include climate and weather condition, animal diseases, changes in prices of agricultural inputs (seeds, fertilizer), plague of insects, etc.

Risk Sources in Agriculture

Risk sources to agribusiness enterprises, generally, can be grouped into social, market, institutional, financial, production and foreign exchange risk (Njavro, 2009; NIPC, 2006). Social risk is suggestive that the risks or hazards have their origin from man. Market risk arises due to fluctuation in input and output prices which may occur when the farmer has made a commitment to produce. It can also be as a result of lower offer prices or entry of big external players. It includes risks that result from unpredictable exchange rates (Hardaker et al., 2004). The farmers therefore face production and market risks that are correlated depending on the level of regional market integration (Sadoulet & De Janvry, 1995). Market variability makes planning difficult by introducing uncertainties which in turn lead to inefficient resource allocation (Hazzel, 1998; Ellis, 2000).

Institutional risk can either be political which is the risk mostly due to instability in government machineries and policies, sovereign risk which is the risk that foreign

governments will not honour commitments such as trade agreements (Hardaker et al., 2004) or transaction risk which results from opportunistic behaviour and the reliability of transacting partners (Dorward *et al.,* 2007).

Production risk occurs because agribusiness enterprise is affected by many uncontrollable events that are often related to weather such as unlimited rain or drought, diseases and pests (especially in poultry business), random physical hazards and technological failure of the production process. Valdes and Konandreas (1981) defined production risks as risks of natural causes. Production risk can be measured using the coefficient of variation, which is a measure of randomness relative to the mean yield value (Hardaker et al., 2004). Yield variability has an effect on the goal of meeting rising aggregate demand and on price and market stability (Aneke, 2007). All these risks collectively affect the farmers' technical and profit efficiency (Barry and Baker, 1984; Bauer and Bushe, 2003; Aneke, 2007), thus they need to be managed.

2.3 Types of Agricultural Risk

a) **Production risk:** This stems from the uncertain natural growth processes of crops and livestock, with typical sources of these risks related to weather and climate (temperature and precipitation) and pests and diseases. Other yield-limiting or yield-reducing factors are also production risks such as excessive heavy metals in soils or soil salinity (Adam, Alessandro & Vincent, 2020).

b) **Market risk:** This largely focus on uncertainty with prices, costs, and market access. Sources of volatility in agricultural commodity prices include weather shocks and their effects on yields, energy price shocks and asymmetric access to information are additional sources of market risk. Other sources of market risk include international trade, liberalisation, and protectionism as they can increase or decrease market access across multiple spatial scales. Farmers' decision making evolves in a context in which multiple risks occur simultaneously, such as weather variability and price spikes or reduced market access (Harvey et al., 2014; Lazzaroni and Wagner, 2016).

c) **Institutional risk:** This relates to unpredictable changes in the policies and regulations that effect agriculture (Harwood et al., 1999), with these changes generated by formal or informal institutions. Sources of institutional risk can also derive from informal institutions such as unpredictable changes in the actions of informal trading partners, rural producer organisations, or changes in social norms that all effect agriculture. Farmers are increasingly supported by and connected to institutions, especially as farm production becomes more market focused (Adam *et al.,* 2020).

d) **Personal risk:** This is specific to an individual and relate to problems with human health or personal relationships that affect the farm or farm household. Some sources of personal risk include injuries from farm machinery, the death or illness of family members from diseases, negative human health effects from pesticide use, and disease transmission between livestock and humans (Arana et al., 2010; Tukana

& Gummow, 2017). Health risks are a major source of income fluctuation and concern for farmers (Dercon et al., 2005).

e) **Financial risk:** This refers to the risks associated with how the farm is financed and is defined as the additional variability of the farm's operating cash flow due to the fixed financial obligations inherent in the use of credit (Gabriel & Baker, 1980; De Mey et al., 2016). Some sources of financial risk include changes in interest rates or credit availability, or changes in credit conditions.

2.4 Risk Mitigation Approaches

Farmers in various places have been reported to adopt some risk management and coping strategies in response to some uncertainties and risks that are encountered in their agricultural operations. According to European Commission (2006), the tools for risk management in agriculture are distinguished in strategies concerning on-farm measures (diversification of the production programmes) or risk sharing strategies like marketing contracts, production contracts, hedging on futures markets, participation in mutual funds, guarantees and insurance schemes. According to World Bank (2011), the Agricultural Risk Management Team (ARMT) at the institution, proffered three clear approaches to risk management:

a) **Mitigation:** This is the lessening or limitation to of the adverse impacts of hazards and related disasters. Risk mitigation options are numerous and varied (for example, crop and livestock diversification, income diversification, soil drainage, mulching, use of resistant seeds, avoidance of risky practices, and crop calendars).

b) **Coping:** This refers to improving risk management to withstand and manage through ex-ante preparation and use of informal and formal in order to sustain livelihoods following an event. Although we have noted that coping is an ex-post activity, it is possible to plan and to prepare for coping activities on an ex-ante basis.

c) **Prevention:** This approach implies risk avoidance. However, this is rarely possible in agricultural production, especially in developing countries like Nigeria where there are very few alternative sources of non-farm employment.

3.0 RESEARCH METHODS

This study adopted descriptive research design using the questionnaire as its major instrument in amassing data in the study. The population of the study is made up of the entire Agricultural Cooperative Societies Organisations and their members in Ekiti State. Akosile et al., (2023) in their study opined that there are 15, 673 registered Cooperative Societies with entire members of about 804,525 in the entire local governments of Ekiti State. From the population of the study which comprises of farmers of animal farmers such as poultry, piggery and fishery in Ekiti State of the registered Agricultural Cooperative Societies, the total sample size used in the study was 190 respondents gotten from Taro Model. One hundred and ninety questionnaires were administered to all the selected farmers for the study. The stratified sampling technique was used in selecting one hundred and ninety farmers of poultry farmers in Ekiti State, Nigeria.

These ten farmer cooperative societies were adopted for the purpose of this study based on the availability of information provided by the cooperative societies.

S/N	NAME OF THE SOCIETY	SIZE	FINANCIAL CAPACITY
1	Springboard Farmers Cooperative Society	400	₦15,800,750.00
2	Agbedola Farmers Cooperative Society	380	₦14,973,825.00
3	Agbewumi Farmers Cooperative Society	530	₦25,390,000.00
4	Itari Farmers Cooperative Society	250	₦10,560,900.00
5	Ado Ekiti Igimoko Ateco Fadama Farmers Cooperative Multipurpose Society	630	₦26,700,950.00
6	Akorede Fadama Used Cooperative Multipurpose Society Limited	340	₦9,850,650.00
7	Agbajowo Fadama Cooperative Society	350	₦13,600,895.00
8	Emure Ekiti Agbeyewa Fadama Poultry Farmers Cooperative Society	280	₦8,500,000.00
9	Irekanmi Fishery Fadama Cooperative Society	310	₦14,860,000.00
10	Ifejola Cooperative Society	270	₦7,600,000.00

Source: Ministry of Trade, Commerce and Cooperative, Ekiti State.

4.0 RESULTS AND DISCUSSION

Table 1: Correlation co-efficient between preventive strategy and Investment of agricultural societies in Ekiti State, Nigeria

Correlations

		Agricultural Investment	Preventive Strategy
Agricultural Investment	Pearson Correlation	1	.923**
	Sig. (2-tailed)		.000
	N	100	100
Preventive Strategy	Pearson Correlation	.923**	1
	Sig. (2-tailed)	.000	
	N	100	100

**. Correlation is significant at the 0.01 level (2-tailed).

The correlation of two variables preventive strategy and agricultural investment were analysed using Pearson Product Moment Correlation. Data was obtained from 100 respondents. The results as presented in Table 4.1 shows that there is relationship between the preventive strategy and agricultural investment; also it was significant (r*[100]=0.000,*

p>0.05). Obtaining a probability of 0.000 which is less than 0.05 significance level for a two-tailed test, the relationship between preventive strategy and agricultural investment is significant. Therefore, we do not accept the alternative hypothesis and reject the null hypothesis. This means that preventive strategy has effect on agricultural investment.

Table 2: Model Summary of Regression Analysis for influence of preventive strategy on agricultural investment

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.964[a]	.929	.928	.94713

a. Predictors: (Constant), Coping Strategy

In the Table 3 the unstandardized and standardized beta coefficient of preventive strategy are 1.113 and 0.964 with t= 35.850 and (p=0.000<0.05). The result shows that preventive strategy exerts significant influence on agricultural investment of agricultural cooperative societies in Ekiti State. The simple regression of the model is shown below as:

AGRI= 1.113-2.579PREV

Where AGRI= Agricultural investment, PREV= preventive strategy.

Table 3: Simple Regression analysis (Beta co-efficient) for coping strategy significance on agricultural investment

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	-2.579	.466		-5.540	.000
	Coping Strategy	1.113	.031	.964	35.850	.000

a. Dependent Variable: Agricultural Investment

From Table 4, the ANOVA result shows that the hypothesis is significant at 0.000 level of significant; therefore, we reject the null hypothesis and accept the alternate hypothesis, concluding that there is a significant relationship between coping strategy and agricultural investment at 0.000 significance level which is less than 0.05 significance level.

Table 4: Simple Regression analysis (ANOVA) for coping strategy influence on agricultural investment

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1152.889	1	1152.889	1285.206	.000[b]
	Residual	87.911	98	.897		
	Total	1240.800	99			

a. Dependent Variable: Agricultural Investment

b. Predictors: (Constant), Coping Strategy

The result of finding shown in Table 1 suggests preventive strategy exerts positive significant influence on agricultural investment in Ekiti State, Nigeria which suggests that as preventive strategy increases, agricultural investment would also increase. Farmers have per time experienced very severe cases of risk which have dragged to a very low-level agricultural investment in Ekiti State, Nigeria. Workable strategies have not been adequately deployed to tackle the challenges that befall agricultural business or investments. This is essentially due to low training of farmers which have made farmers bereft of preventive strategy required to tackle agricultural risk; such missing link has from our findings proven to bring damages to agricultural investment in Nigeria. The finding is directly related to the work of Sayavong (2016) which demonstrated that calendar adjustment is the only strategy that is able to reduce the risk from floods; anti-flood seeds technique is insignificant in the survey locations. Furthermore, it was discovered that access to irrigation systems and main road can allow paddy farms. Onubuogu and Esiobu (2016) revealed that agricultural risks affecting farming households include Fulani herdsmen cow attack causing damage on crops; farmers Risk-Smart options are just insufficient to prevent them from devastation.

Lastly, it was established from the findings that coping strategies exert positive significant influence on agricultural risk in Nigeria which implies that as coping strategies are deployed increasingly, risk mitigation in agriculture is achieved at an increased level. When farmers finally understand that risk is practically inevitable in agricultural business, they tend to farm on a very large scale; this is usually for wealthy farmers or individuals/corporations that are credit worthy and can obtain loan from their cooperatives. Hence, farmers have not basically leverage on agriculture alone, they engage in other business activities to pull funds into agriculture thus dragging down the potentials of agriculture. This, which is due to lack of support from government and other organisations, has encouraged divestment agriculture which has in effect caused continuous fall in agricultural output in Nigeria. Shockingly, farmers with critical finance ability put their agricultural assets to sale to raise funds for improved risk mitigation on their farm lands; this suggests the height of incapacity most farmers have and it displays the future of agriculture and agricultural investment in Nigeria. The finding is in line with work of Mesike, Ibikunle and Eboigbe (2019); discoveries from the study revealed that risk factors

such as fire outbreak, flooding and other climatic factors by rubber small holders were the main reason for cultivating more than one farm plots; population pressure was another cause of scattered farm plots. Findings also indicated that the average farm size was 6 hectares while the incidence of scattered farm plots was found not to be inefficient as widely assumed. Ibeagwa, Ehirim, Ben-Chendo, Ukoha, Osuji, Madubuike, Okwara and Martins (2019). Findings from the study indicated that educational level, age, farming experience, farm size, household size and farm income were the factors influencing the estimated output of the farmers.

5.0 CONCLUSION AND RECOMMENDATION

Based on the findings, the study concluded that there is significant relationship between preventive strategy/coping strategy and agricultural investment in Ekiti State. Following the findings drawn from the results obtained in this study alongside the conclusions, the study therefore recommends that the technological training programme should be occasioned at the local government level so as to improve farmers' technological awareness and possible integration of technology in agricultural practice towards alleviating agricultural risk. Government should commit itself seriously with the introduction of insurance coverage as well as sensitizsation in this regard as this is urgent in mitigating the economic implication of risk on agricultural investments in Nigeria. Finally, effort should be exerted towards facilitating quality training for farmers on sound risk management strategies; this would improve farmers' innovation and cause blossom farm practices and experience.

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