ASSESSMENT OF CROP FARMERS' ATTITUDE TO RISK AND MANAGEMENT METHODS IN OYO STATE, NIGERIA

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Abstract

Agricultural sector faces series of risks which befall at different frequencies. This study examined the crop farmers' attitude to risks and their management methods in Ogbomoso, Oyo State, Nigeria. Specifically, the study examined the risk attitude of farming households, and analyzed the risk management strategies adopted by farming households in the study area. A four-stage sampling method was adopted to elicit response from selected 150 farming households for this study. The dataset was analyzed with the use of descriptive and inferential statistics. Safety-First-Model (SFM) was employed to analyze the risk attitude among crop farmers. The result revealed that majority of the farming households head was male and married with the mean age of 42 years and a moderately large household size of five persons and inheritance was the prominent means of farmland acquisition. Descriptive statistics showed that high cost of labor input topped the ranking of the risk source in the study followed by high input prices. Lacks of extension advice, low crop prices, were also common. Risk management methods employed to mitigate risk by majority of the farm families was sale of assets followed by income diversification. The SFM result revealed that all the food crop farmers were intermediate risk averse.

Key words: risk attitude, risk management, Safety First Model.

JEL[5]: Q10, Q15

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Introduction

Agricultural growth in Nigeria could be recognized as important for improvement in the economic expansion of the country and food security and nutrition for the proliferating population. Although, the main contribution of the agricultural output in Nigeria, especially food crops, is obtained from small-holder farming, where the system of farm production is mainly traditionally accompanied by low productivity. Small scale farmers dominate the food production decisions in Nigeria whereas they are faced with several risks (Salimonu, Falusi, 2009).

The commonly cultivated food crops in Nigeria include rice, maize (Udensi, Omovbude, 2018), cowpea, yam (Akinniran et al., 2017), melon, groundnut, cassava, sweet potatoes, millet, sorghum which contribute immensely to food security that meets the nutrition consumption requirements of the households, and serve as a basic sources of livestock feeds (Ala, Bello, 2010). The contributions of food crops to national economic development cannot be underrated. The efficiency of the human resources is however dependent on how well fed they are (Omonona, Agoi, 2007).

Considering the quality and quantity, food insecurity is one of the characteristics of the developing countries where Nigeria is not excluded. Food crops farmers in Nigeria are unexceptionally constrained by insufficient resources in terms of access to both land and capital. Farmers majorly relied on family labor as their most promptly available and adaptable factor of production and their primary goal is to feed the family. In the effort to decide a cropping strategy to be adopted, food crops farmers specifically depend on its labor demands and give preference to the best strategy that can satisfy their subsistence consumption. Stated their prevailing condition, it is obvious that risk is a significant factor in explaining food crops farmers' dispositions to new technologies, their adoption and their allocation or choice of resources. Adequate understanding of the mechanisms of production decision making by the "farmers under uncertainty has become more and more substantial due to the declining stability of production and economic conditions in agriculture in recent years" (Piotr et al., 2020). Risk is unavoidable in any kind of profitable production in which agricultural production is not exempted. Thus, the maxim "the higher the risk, the higher the profit" explains that agribusiness sectors that involve high risks are equally profitable, while they provide good return to investment.

The farming business is attached with a lot of risks when compared to other businesses. Farmers in this case, unlike other people, have to place bigger weight on impending negative outcomes of risk. They rather sacrifice their potential income to steer clear of either risk or uncertainty. Smallholder farmers are not

surprisingly excited in avoiding risks taken that may threaten sustainability of their livelihood. These attitudes sway the categories of inputs employ and the total level of produce they produced from these set of inputs. In several ecosystems, risks aversion is one of the important components in many variations of the level of the intensive poverty circle (Salman et al., 2010). It must be considered harmful and dangerous when the poor are risks-averse to the extent that they are not incline to invest their resources in the purchase of modern technology inputs only because of the risks associated, they will continue to be poor (Mosley, Verschoor, 2015). Piotr et al. (2020) postulated that risks are attributed to agriculture and the position of farming households to risks always determine input choices of farmers. The attached time lag in agricultural practices used to hold back the correct prediction of expected outputs and that of their prices. Thus, it could raise the fear of risk and uncertainty.

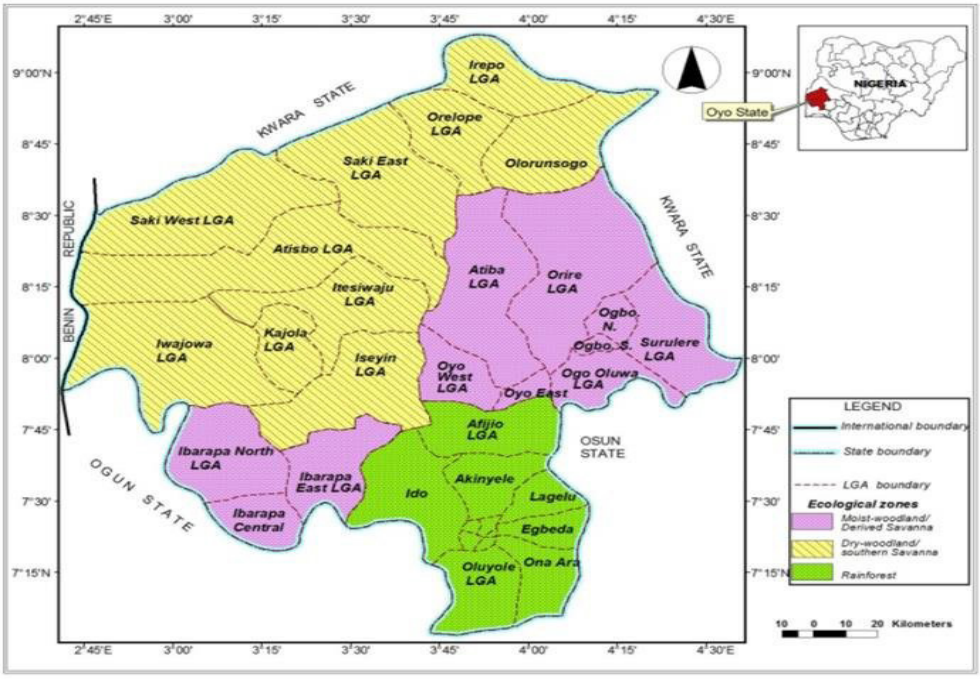
Olarinde et al. (2007) viewed risk as a social and cultural construction where different societies, political and economic circumstances demarcate its diverse significant meaning. Several communities in the low-income countries which including small-scale farmers encounter a series of threat that are been controlled to the bearable minimum in the medium and high-income countries, hence have extinct from the observation among its people. Farmers' outputs and income in agricultural production normally depend on several external factors which are climatic condition and price volatility; risks are pervasive in farmers' decisions (Akinniran et al., 2017).

The importance of food is seen as the basic means of sustenance, when taken in an appropriate proportion, it enhances sound health and productive life. Food is undoubtedly the basic necessity of life (Omonona, Agoi, 2007). Several pieces of research have been carried out in Nigeria to analyze the risk attitudes and management strategies employ by small holder farmers (Ayinde et al., 2008), production decisions and choice of technology (Finkelshtain, Feinerman, 1996). Other studies have assessed that the attitudes of farmers and processors towards risks are important in agribusiness (Liu, Huang, 2013) and the use of assets and savings to manage risks (Udry, 1995). The study of risk in agriculture is not a new issue. But some researches have centered on the links among food crops, threat mindset and risk control of farming households in the Nigerian context. There is a proof that this type of study is very rear in Nigeria, specifically in Oyo state. Hence, there is need for the study to examine the risks attitude and control techniques among food crop farmers. Thus, the interest is to study these specific objectives: (i) describes the socioeconomic characteristic of farming households; (ii) examine the risk-attitude of respondents; and (iii) examine the risks management techniques among the food crop farmers.

Research Methodology

This study was done in Oyo state of Nigeria, selecting Ogbomoso agricultural development zone (Picture 1.). It comprises of 5 local government areas (LGAs), these include Surulere, Ogbomoso-north, Ogo-oluwa, Oriire, and Ogbomoso-south LGAs (Ewetola et al., 2017). The climatic condition is equatorial, and it is notable for dry and wet seasons which have relative high humidity. This dry period averagely extends to March from November. While the wet or rainy season normally begins in April and ends in October. Average temperature is between 25 °C and 35 °C, all the year round (Akinniran et al., 2017). The people in this area are predominantly farmers, while several of them combine trading, art-craft and civil service with farming. Arable crops like vegetables, tomatoes, pepper, maize, and cassava, are grown in the area. Livestock farming like sheep, goat keeping, and poultry farming are also common. The climate and soil type of the state is suitable for the cultivation of a wide range of crops making agriculture the primary occupation of the people.

Picture 1. Map of Oyo State



Source: Salami, Akinyele, 2015.

To attain the study objectives, primary data was gathered via the use of structured questionnaires which were administered to the crop farmers. The information

collected from farming households includes; data on socioeconomic variables which include age, sex, family size, marital status etc. Closed and open-ended questions were adopted. A four-stage random sampling process was followed to choose the respondents (Ayinde, 2016). Oyo state comprises of four principal Agricultural development zones which are Oyo, Ibadan/Ibarapa, Saki, and Ogbomoso zones.

In stage one simple random selection of Ogbomoso zone was done. Then 60% of the Local Government Areas (LGA) was selected in Ogbomoso ADP zones. This entails the purposive choice of three out of the five local authorities 'areas with a rural outlook. In stage three, the random choice of five villages in every local authority's area was done, and this made a complete of fifteen villages. In the final stage, 10 farming households were randomly selected from every village, and these are total of 150 farming households. Various analytical techniques were used to analyze the data. This includes descriptive statistics like frequency count, percentage, mean, sum and standard deviation. Inferential statistics like Safety First Model by Moscardi and deJanvry (1977), adapted from (Akinniran et al., 2017).

There are many approaches to measuring risk attitude of farmers to production risks (Moscardi, de Janvry, 1977; Just, Pope, 1979; Antle, 1987). As cited in Dadzie, Acquah (2012) Moscardi and de Janvry categorized these manners of measuring risks as direct and indirect. They concluded that the direct method, which was developed by von Neumann and Morgenstern, has many faults resulting from different levels of subjects' tolerance or otherwise for gambling and these are not intuitively obvious. The principle of safety first was first introduced by Kataoka (Mitra, Sharmin 2019). This model was modified by Moscardi and de Janvry (1977) and utilized by Amaefula et al. (2012). The assumption of the principle is that it is the farmer's objective to minimize the likelihood of facing crop production variability, which is a reduction in produce below a level.

Descriptive Statistics

We employed descriptive statistics to describe socioeconomic characteristics, perception and risk management strategies among the crop farmers. The tools used include mean, frequency distribution, percentages, and sum.

Estimating Risks Attitude Coefficient

The Safety-First Behavioral model (SFM) was adopted in estimating risks attitude, this relied on the evidence of Moscardi, de Janvry (1977).

$$K(s) = \frac{1}{\theta}\left(1 - \frac{PiWi}{Py\beta i\mu y}\right)$$

Where:

Ks = risks index;

θ = variance parameter;

Pi = price of unit of the most significant inputs chosen;

W_i = chosen quantities of the most significant inputs;

Py = unit price of the output;

Bi = output elasticity coefficient with respect to the selected input; and

μy = average of the output.

The output variation's coefficient (θ) was estimated through summary statistics of output.

$$\theta = \sigma y / \mu y$$

Where:

σy = standard deviation;

μy = mean of yield.

The inputs and produce prices that were employed are the widespread market prices at the period of household data collection. Farming households were divided into 4 categories that are based on the parameter for risk "k" following Moscardi and de Janvry (1977). Farmers prefer risk i.e., risk-preferring given that $k<0$; they are low-risks-averse given that $0<k<0.4$; they are intermediate-risk-averse given that $0.4\leq k\leq 1.2$, while famers are high-risk-averse given that $1.2<k<2.0$.

Results and Discussion

Socioeconomic Characteristics of Respondents

This section presents the socioeconomic characteristics of farmers in Ogbomoso, Oyo State. The characteristics discussed are age, gender, marital status, household size and level of education. This information is needed to describe the actual condition of respondents before it is further analyzed.

In Table 1. are shown that the majority (57.3%) of the heads of farming households were male, when 42.7% of the farm families had female as their household heads. This indicates that men dominate crop farming in the area probably because crop production in the country is highly labor-intensive. This corroborates with the discovery of Akinniran et al. (2017), which stated that higher percentage of male

gender participates in food crop production because some levels of diligences are required and the kind of expertise that is predominant found among male farmers.

Table 1. Socioeconomic characteristic of Crop Farmers

Characteristic	Category	Frequency	Percentage
Gender			
	Male	86	57.3
	Female	64	42.7
Age (years)			
	≤30	11	7.3
	31-40	46	30.7
	41-50	59	39.3
	51-60	29	19.3
	>60	5	3.3
	Mean	42	
Marital Status			
	Single	8	5.3
	Married	112	74.7
	Divorced	14	9.3
	Widowed	16	10.7
Household size			
	≤4	63	42
	5-8	84	56
	>8	3	2
	Mean	5	
Level of Education			
	No formal education	63	42
	Primary	66	44
	Junior secondary	11	7.3
	Senior secondary	4	2.7
	Tertiary	6	4

Source: Akanbi et al, 2021.

The result revealed that larger percentage (39.3%) of sampled farm families were between 41 and 50 years of age followed by 30.7% which were between the ranges of 31-40 years of age. This indicates that majority of farmers were active and in their productive ages, they are expected to take risk towards improving their level of output. The mean age of the respondents from this study area is 42 years.

Regarding the marital status, the result showed that the majority (74.7%) of the food crop farming household heads was married, 10.7% were widowed, and 9.3% were divorced while only 5.3% were single. The higher percentage of married people from the result indicates that married people dominate crops farming considering its

capability to ensure food security of the entire farming household. Perhaps, family members (spouse and children) would render productive assistance on farm this implies that family labor is available to the farming households.

The result also indicates that 56% of the food crop farmers had household size that was between 5-8 members, 46% had not more than 4 (i.e., ≤4) members while only 2% had more than 8 members in the household. The average size of households of the respondents is 6 members. It connotes that the food crop farming households could have a considerable number of family members as labor to complement the population of labor inputs.

A large percentage (44%) of the crop farming households in the area had at least primary education followed by 42% who had no former education. Only 4% of the household heads had tertiary education; this means that food crop farm families are not well educated. More educated people are expected to partake in food crop production to allow them adopting the best risks management strategies to maximize their output as well as the level of profit after the farming season as recommended by Kahan (2013).

Attitude of Food Crop Farmers toward Risk

The risk attitude of the farming households in this study was estimated through production function, with marginal products alongside the variation's coefficient, prices and weight (Kg) of inputs and outputs. The result of the risk parameters estimated was used to categorize these crop farmers in this study with regards to the level of risks categorization of Moscardi, de Janvery (1977). Risks parameter (K) was calculated using yield or outputs variation's coefficient (θ), prices of factors (price per kg of the most significant or influential input), (Pi), mean yield (μy), input level (kg/ha), (Xi), price of output/kg (P), and elasticity of input (fi).

The yield or outputs variation's coefficient (θ) was estimated through the summary statistics of yields. Farming households were categorized into four categories based on the parameter of risk "k" following Moscardi and de Janvry (1977). Farmers are risk-preferring given that $k<0$; they are low risk-averse given that $0<k<0.4$; they are intermediate-risk-averse given that $0.4\leq k\leq 1.2$; and are high-risk-averse given that $1.2<k<2.0$. Results showed that all the food crop farm families in this study were risk intermediate, risk aversive according to their respective risks attitude scores fall between $0.4 \leq K \leq 1.2$. Considering this result, it can be inferred that the profit maximization is not the only ambition of the farmers as they tend to be more cautious individuals with fore choice for limited risky sources of income.

Risk Management Strategies of the farmers

The result from Table 2. reveals that every farmer (100%) in the study area liquidates their assets anytime problem arises. The common assets the farmers usually liquidate to manage their financial problem includes stored grains, livestock, firewood. This was followed by diversification of income (88.7%) such as wage employment, off farm income, remittance. Wealth accumulation for future use was the 3rd management practices employed by food crop farmers with 80%. Respondents save their wealth for future use in term of bank savings, planting of economic trees, investment in livestock and education of children. However, estimated 78% of the farmers adopted the use of fertilizer (organic or inorganic) as a measure to control the infertility of the soil. Around 60% of them obtained loans from banks and other financial institutions to reduce their financial difficulties. Crop diversification where different kinds of food crops were grown alongside cash crops and other special crops were employed by 40% of the respondents, while only 12% of the crop farming households in this study consulted extension agents for proper risk management.

Table 2. Distribution of Risks Management strategies employed by Farmers

Management strategies	Frequency	Percentage	Rank
Loan	90	60	5
Other Source of income	133	88.7	2
Wealth Savings for future	120	80	3
Fertilizer	117	78	4
Diversification of production	60	40	6
Extension services	18	12	7
Selling of assets	150	100	1

Source: Akanbi et al., 2021.

Conclusion

Fertilizer and farm size have effects on the farm yields of the farmers in this study. Majority of the farmers are male, while larger percentage of them is within their productive and active age. The majority of the farmers are married; they have large family size and this shows that they have access to family labor. The literacy level of the respondents is low majority has primary education. All crop farm families in this study were intermediate risk-aversive. Among the risk management strategies adopted by farmers, selling of assets is more common than any methods; it is followed by diversification of livelihood and savings. The least employed strategy is the consultation of extension agents. Fertilizer remains the most popular input used by the food crop farming households in this study.

Policy Recommendations: Based on the conclusion of these findings, females and the youth should be encouraged to play more roles in crop production. Government and non-governmental organizations should orientate village dwellers on the economic importance of education to the efficiency of agricultural production. More extension workers should be employed and post them to the villages for easy extension services to the farmers. Government should provide basic amenities such as farm machineries, irrigation system, and storage facilities among others are necessary to encourage farming, prevent post-harvest losses and maximize production yield. Farmers should be willing to adopt new innovations and shun obsolete system of farming. It is also recommended that a further research on the effect of farmers' risk attitude on profitability among the farming household in the area.

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