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Full Length Research Paper

Risk attitudes and management strategies of small – scale crop producer in Kwara State, Nigeria: A ranking approach

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The risk attitude of small-scale crop producers in kwara State, Nigeria was examined. The study ranked the risk preference and management strategies of small-scale crop producer in the study area. A three – stage stratified random sampling was used to draw a sample of 250 crop producers from the four agro-ecological zones in Kwara State. Well structured questionnaires were used to obtain information from selected crop producers. Descriptive analysis, Paired Comparison Method and Least Significance Difference were used to analysis the data. The results show that farming households in the study area placed different preference on the risk attitude namely risk taking, risk neutral and risk averse. The households mostly employed crop diversification and least employed insurance as their risk management strategy. To this end, programmes and policies for small scale farmers should incorporate their risk preference for the possibility of producing the desired effect and improve the efficiency of crop management and production.

Key words: Risk attitude, management strategy, households, rank, kwara.

INTRODUCTION

Agricultural production is highly characterized by risk. Particularly, production decisions are generally made under the environment of risk and uncertainties. Yield, product prices, and to a more limited extent, input prices and quantities are usually not known with certainty when investment decisions are being made. In many cases, farmers are confronted with risk of pests and diseases which may cause product prices to decline. Such characteristics result in returns displaying high variability. Returns vary with the farming system, and climate, policy institutional setting amongst others; these in turn affect production decisions.

In production economics, marginal analysis is used to decide on recommended levels of input to predict product levels, product prices or to foretell the impact of technology based on certainty assumption.

However, in practice and outside theory, risk is everywhere and is substantially unavoidable. For many day-to-day decisions, risk is usually unimportant since the the scope of possible loss is judged to be low. But, for important life decisions or for some decisions in business or government, there is a good deal of uncertainty and there are important differences between good and bad consequences. For these decisions, such as production decisions, risk may be judged to be significant.

In the prevalence of risk, the prescription of optimality conditions of conventional production theory is invalidated in principle. Each decision needs to be analyzed with risk being accounted for.

With the need to include risk in decision analysis, small-scale farmers only unconsciously and intuitively engage in the outlined risk management principles and procedures. These small-scale farmers exist at the margins of modern economy. They have one foot in the market economy and the other in subsistence. They are thus neither fully integrated into that economy nor wholly insulated from its pressure. Hence, they are more exposed to risk than other segments of the population (Adubi, 2000).

Knowledge of small-scale crop producer's attitudes to risk and their management strategies under risk is important in determining strategies and formulating poli-

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Table 1. Estimated populations of farm families of KWADP ZONES (Kwara State Agricultural Development Programme).

ZONE	Existing number of blocks	Selected numberof blocks	Farm families population	Number of respondents selected
KAIAMA	4	2	23,444	32
PATIGI	5	3	47,015	64
SHAO	6	3	48,915	66
IGBAJA	8	4	65,618	88
TOTAL	23	12	184,992	250

Source: ADP Survey (1992).

cies for agricultural development. This will lead to the development of a normative decision theory based on the inclusion of stochastic element in whole farm planning models for agricultural development via the small-scale farmers. Hence the study therefore examines the risk attitudes and management strategies among small-scale crop producers in kwara State. The study ranks the risk preference and management strategies of small-scale crop producer in the study area.

METHODOLOGY

The study area

The study was carried out in Kwara State of Nigeria. The state was created by the Federal Government in May 1967. It com-prises sixteen (16) Local Governments with a population of about 1.8 million (1991 census) . It has a total land size of 3682500 hectares (F0S, 1995). It is located between Latitudes 7^0 45^1N and 9^0 30^1N and Longitude 2^0 30^1E and 6^0 25^1 E. The topography is mainly plain to slightly gentle. Agriculture is the major occupation in the state with over 70 percent of the population being farmers. The climatic pattern, vegetation and the fertile soil make the state suitable for the cultivation of a wide range of food and tree crops. The major food crops planted are cassava, yam, maize, rice, soyabeans, cowpea, guinea-corn and millet. The major mineral resources in the state are limestone, feldspar, kaocin, clay, gra-nite, quartz and tantalite (KWMANR, 2004).

The sixteen Local Government Areas (LGA) have been divided into four zones by the Kwara State Agricultural Development Project (KWADP) in consonance with ecological characteristics and cultural practices (KWADP 1998). These zones are further divided into blocks on the basis of the extension-farmers ratio. The extension staffs are the Block Extension Agents (BEAs). The blocks each zone contains as follows:

Zone A: Kaima, Gwanra, Okuta and Yashia Blocks.

Zone B: Kpada, Lade, Lafiaji, Shonga and Bacita Blocks.

Zone C: Gamo, Temidire, Aboto-Oja, Paiye, Oloru and Bode-Saadu Blocks.

Zone D: Oke-Odo, Obbo-Ile, Olla, Iwo, Iponrin, Igbaja Offa and Oro Blocks.

The zones have their headquarters. Zone A's headquarter is Kaiama; zone B's Headquarter is Patigi; Zone C's headquarter is Shao and Zone D's headquarter is Igbaja. Hence for this study zones are named by their headquarters.

Sampling design

The population for this study consists of small scale farming households of Kwara State. A three - stage stratified random sampling technique was utilized to select the sample for the study. In the first stage, the non-overlapping four zones Kaiama, Patigi, Shao and igbaja zones were utilized. In the second stage, half of the blocks in each zone were randomly selected. While in the third stage, the farm families' population provided by ADP was utilized (Table 1) to select a sample size of 250 for the state using proportion allocation technique. By this technique, the number of sampled farming households was obtained such that

$$n_h = \frac{nN_h}{N} \qquad (1)$$

Where;
n_h = Number of farming households to be selected in stratum/zone h
n = Total number of sampled farming households
N_h = Number of farming household population in zone or stratum h
N = Total number of farming household population

Consequently, a random sample of 32 respondents was taken from Kaiama zone, 64 from Patigi zone, 66 from Shao zone and 88 from Igbaja zone based on the farming household population's proportion of the zones (Table 1).

The primary data were collected during the 2005 production year through a survey with the aid of interview schedule administered to the heads of the selected farming household heads with the assistance of well trained enumerators. A pretest was carried out in order to standardize the survey instrument.

Analytical technique

Two major tools of analysis were employed in this study. They are: Descriptive analysis and Paired Comparison Method.

Descriptive analysis

Descriptive analysis of data was employed for this study. This involved calculating of frequency, percentages, and means.

Paired comparison method (PCM)

The method of paired comparisons used by Bradley and Ralph (1976), and adapted by Durojaiye (1991) and Adewumi and

Table 2. Frequency Matrix and Rank of Household Heads Risk behaviour for Kaiama zone.

	Risk averse	Risk neutral	Risk taking	
Risk-averse		4(12.50)	7(21.87)	11
Risk-neutral	22(68.75)		1(03.13)	23
Risk-seeking	28(87.50)	27(84.38)		55
Preference frequency	50[a]	31[b]	8[c]	89
Rank	1ST	2ND	3RD	LSD=15.68

Omotesho (2002) was used to develop the farmers' attitude toward risk. The assumptions of the paired comparisons model used in this study are as used by Mosteller (1951).

This method requires that the respondent be presented with a list of all possible pairs of risk attitudes and that the respondent select the preferred attitude in each pair. The number of pairs for a given set of attitudes is given by:

$$(n(n-1))/2 \quad (2)$$

Where n= number of risk attitude to be ranked

The relative frequency with which an attitude is chosen was used to establish its ordinal rank. This attitude ranking was tested for statistical significance using the method reported in Urquhart and Clyde (1978). The Test statistic at the 0.05 level of significance is:

$$LSD = 1.96(SF\ (n)(n+1)/6)^{1/2} \quad (3)$$

Where LSD = Least Significance difference; SF= number of surveyed crop producers; n= number of risk attitude to be ranked

The hypothesis tested here are:

H_0: crop producer's risk attitude are equally ranked
H_1: crop producer's risk attitude are not equally ranked

The null hypothesis is rejected if the difference between the preference frequency is greater than the calculated Least Significance difference.

In addition the Least Significance difference was also used in ranking crop producers management strategies.

RESULTS AND DISCUSSION

Ranking risk attitude

The result of the survey of farming households' heads risk behaviour using paired comparison method is presented in Tables 2- 5. The numbers of each column indicate the frequency with which a farmer preferred a risk attitudinal behaviour than another attitudinal behaviour represented by the representative rows.

Using the method of paired comparison (Tables 2-5), the ranking pattern of the household heads of the risk behavioural group is the same in all the zones except in Patigi zone. Risk averse behaviour ranked first with a total preference frequency of 50 in Kaiama zone, 83 in Shao zone and 128 in Igbaja zone. Risk neutral behaviour ranked second with a total frequency of 31 in Kaiama zone, 80 in Shao zone, 106 in Igbaja zone. The risk taking behaviour ranked third. In Patigi zone, the method of paired comparison revealed that risk taking behaviour ranked first with a total frequency of 75; the risk averse behaviour ranked second with a total frequency of 51; and the risk neutral behaviour ranked third.

The Least Significant Difference (LSD) statistic was calculated for the different zones (Tables 2, 3, 4 and 5). Given the test criterion of the LSD statistic the analysis revealed that all the differences in the preference frequency of risk behaviour in Kaiama zone alone are significant; whereas the differences in the preference frequency of risk – averse and risk – neutral behaviour for the remaining 3 zones (Patigi. Shao, Igbaja) are not significant.

The preference frequency for risk–averse behaviour was not statistically different from the preference frequency for risk neutral in Patigi, Shao and Igbaja zones, since the differences between the two risk behaviours were less than the calculated LSD statistic. This therefore implies that the farming households are indifferent in their behaviour to being risk averse or risk neutral. The two risk behaviour is therefore ranked equal. Also, it was observed that the risk seeking attitudinal behavior did not only rank last but also statistically different in Shao and Igbaja zones. It can therefore be inferred from this analysis that the farming household heads in Shao and Igbaja zones placed lower preference on risk taking behaviour.

In Patigi zone, risk taking behaviour ranked first and also statistically different from other behaviours. Hence, farming households in Patigi zone prefer to take risk.

It was revealed that in Kaiama zone the three attitudinal behaviour preference frequencies were statistically different and hence they are ranked differently as the differences between the risk behaviour were greater than the calculated LSD. This implies that the farming households in Kaiama zone placed higher preference on risk-averse behaviour followed by risk neutral; and lastly risk taking behaviour.

Ranking risk management strategies

The impact of cooperative society as source of capital, crop diversification, crop rotation, shifting cultivation, fallowing, mixed cropping, timely planting and timely

Table 3. Frequency matrix and rank of household heads risk behaviour for Patigi zone.

	Risk averse	Risk neutral	Risk taking	
Risk-averse		29(45.31)	34(53.12)	63
Risk-neutral	24(37.50)		41(64.06)	65
Risk-seeking	27(42.18)	20(31.25)		47
Prefrence frequency	51[b]	49[b]	75[a]	175
Rank	2ND	3RD	1ST	LSD=22.17

Table 4. Frequency matrix and rank of household heads risk behaviour for shao zone.

	Risk averse	Risk neutral	Risk taking	
Risk-averse		33(50.00)	23(34.85)	56
Risk-neutral	41(62.12)		13(19.70)	54
Risk-seeking	42(63.64)	47(35.39)		89
Preference frequency	83[a]	80[a]	36[b]	199
Rank	1ST	2ND	3RD	LSD=22.51

Table 5. Frequency matrix and rank of household heads risk behaviour for Igbaja zone.

	Risk averse	Risk neutral	Risk seeking	
Risk-averse		43(48.86)	37(42.05)	80
Risk-neutral	68(77.27)		29(32.95)	97
Risk-seeking	60(68.18)	63(71.59)		123
Preference frequency	128[a]	106[a]	66[b]	300
Rank	1ST	2ND	3RD	LSD=26.00

Source: Field survey, 2005/2006. Figures in parentheses are the percentage of the total respondents represented by the frequency. a, b, c are statistically different attitudinal frequencies. Values with the same letters are not significantly different at 0.05 level of significance.

harvesting were enumerated as measures of risk reduction or risk aversion.

However from the field survey the risk management strategies employed by crop producers are ranked in Table 6 and that most preferred are ranked in Table 7. It was revealed that the most used risk management strategy employed by the respondents was crop diversification and followed by income diversification and cooperatives. lastly risk taking behaviour.

Respondents are indifferent to the most used among cooperatives in terms of labour, market sales and capital assistance and income diversification. Although Insurance and contract sales are seen as a good measures but are least used by the respondents

The respondents suggested assistance from government in order to reduce their level of risk. They suggested technical assistance in form of training on improved farming system and improved technology. Assistance is also suggested to be in form of soil test, irrigation, provision of credit, timely and even distribution of seeds and fertilizers. The farmers advocate the establishment of good marketing policy and environmental policy to provide ready made market and prevent nomads and thieves. Lastly, the farmers request for better attention in the national budget to the farmers and agriculture in general.

Conclusion and Recommendation

It can be concluded from the ranking of crop producer risk preference, zone A placed higher preference on risk averse attitude while zone B placed higher preference on risk taking attitude. Zones C and D are indifferent in their preference of risk averse and risk neutral attitude but placed lower preference on the risk taking attitude. From the analysis carried out and the field study conducted, it is evident that small scale crop producer exhibit different risk attitude and not all are risk averse as been assumed in literatures. There exists a part of risk taking attitude which is inherent in indivi-

Table 6. Frequency Matrix of Households Most Used Risk Strategies.

Risk strategies	Used frequency	Rank
Insurance	1032[d]	8TH
Crop diversification	3946[a]	1ST
Timely activities	1731[c]	5TH
Cooperatives	2736[b]	3RD
Hedging	1164[d]	6TH
Income diversification	2823[b]	2ND
Avoidance	1861[c]	4TH
Contract market	1041[d]	7TH
LSD statistics	576.12	

a, b, c are statistically different frequencies. Values with the same letters are not significantly different at 0.05 level of significance.

duals resulting from their socio-economic characteristics. To this end, programmes and policies for small scale farmers should incorporate their risk preference. There is a possibility that such programme and policies may produce the desired effect and improve the efficiency of crop management and production.

It is recommended that there is the need to group the farmers into societies, unions or cooperatives. This will facilitate positive interactions especially on risk sharing. This will present a collective bargaining front, and serve as a conduct for transmitting government extension recommendations to the farmer.

It is also recommended that there should be a concerted effort by government to increase farm income and less variability in returns by exploring various mean of minimizing risk on the farm. To this end, crop insurance scheme may be instituted for the farmers. Nigerian Agricultural Insurance Corporation (NAIC) should be made more functional for the small farmers.

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