

Research Paper

POVERTY AND RISK ATTITUDES: THE CASE OF CASSAVA FARMERS IN AWUTU-SENYA DISTRICT OF THE CENTRAL REGION OF GHANA

ABSTRACT

Farmers' risk aversion attitudes have been blamed for low adoption of new and improved agricultural technologies that are recommended to increase production. The risk attitudes of farmers can be said to be affected by poverty amongst farmers. This paper sought to confirm this hypothesis by following Aye and Oji (2008) and therefore; investigates poverty situation among cassava farmers in the Awutu Senya District in the Central Region of Ghana, analyzes the risk attitudes of cassava farmers, and determine the effect of poverty on risk attitudes of the farmers. Fifty farmers were selected using lottery approach of the random sampling technique and interviewed with structured questionnaire. Data analysis was done using descriptive statistics, the Foster Greer Thorbecke poverty measures, Equal Certainty Equivalent Risk Model and regression analysis to determine the effects of poverty on the risk attitude of farmers. 58% of the farmers interviewed were found to be within the poverty bracket and the depth of the poverty being 31%; a poverty situation that looks relatively better compared with the findings of Aye and Oji who studied farmers in Benue State in Nigeria. Furthermore, the result from the equal certainty equivalent risk model of assessing farmers' risk attitudes shows that as many as 82% of the farmers were risk averse. The result of regression suggests that degree of poverty, as well as age, household size, educational level, and land size were significant determinants of farmers' attitude towards risks. Poverty situation was found to be positively related to risk averse attitude of farmers. It was therefore recommended that government and the private sector should create the enabling environment to assist farmers to improve on their risk management skills to mitigate the effect of perceived risky situation they find themselves in the study area.

Key words: poverty, risk attitudes, farmers,

1. INTRODUCTION

The Agricultural sector in Ghana is dominated by small scale subsistence farmers and it contributes significantly to the country's economy. It employs 60 percent of the country's workforce and, contributes 34.5 percent to the Gross Domestic Product (GDP), and with real Agricultural GDP growth of 6.2 percent (Ghana's Agricultural Facts and Figures, 2009). Underlying these statistics is the sector's low productivity which stems from use of low-input/low output technologies, high post harvest losses, appropriate processing/ value-adding technologies are either unavailable or rudimentary if available at all, production is poorly linked to demand and market information is not widely used by producers, a situation which fundamentally hampers increased productivity in the sector (TIPCCE, 2003).

In addition farmers are not sure of the weather, government policies, as well as changes in technology – factors which make it difficult for them to predict the future with certainty. Added to these facts is that farmers are generally poor and therefore unable to take actions which will mitigate the effects of this unfortunate situation on their livelihoods. The vicious circle of poverty takes many forms but one key element in many versions of the spiral, in any country or environment, is risk aversion. If poor people are risk-averse they are not willing to invest in the acquisition of modern assets because that involves taking risks, hence they will remain poor (Moscardi, 2003).

Indeed, the present poor state of Ghana's agriculture can also be traced to farmer's attitudes towards risks which essentially constrained their ability to adopt new production technologies, as well as risks in the production and socioeconomic environments. Poverty is also recognized as a major constraining factor in the farmer's production and environment, therefore there is need for a detailed study on the effect of poverty on farmer's attitude towards risks. Presently, however there is paucity of information on this aspect of study in the study area in the sense that most studies in Awutu- Senya district in particular had focused on either poverty or risk attitudes or risk management but little or no attempt has been made to relate poverty and risk attitude of farmers. It is with this background in mind that this study has been conceived to empirically ascertain the relationship between the incidences of poverty among small-scale farmers and their attitudes towards risks in the study area. Thus the research questions formulated to guide the study are:

- i. What is the poverty situation among cassava farmers in the study area?
- ii. What is the risk behavior of cassava farmers in the study area?
- iii. What is the relationship between farmer's poverty situation and their risk attitude?

2. OBJECTIVES OF THE STUDY

2.1 Broad Objective

The broad objective of the study is to ascertain the determinants alongside the incidence of poverty of the risk attitude of cassava farmers in the study area.

2.2 Specific Objectives

To address the broad objective of this study the following specific objectives were specified:

1. To determine the incidence of poverty among cassava farmers.
2. To analyze the risk attitudes of cassava farmers.
3. To determine the relationship between the incidence of poverty and risk attitude of farmers.

79 3.THEORETICAL FRAMEWORK

80 There are different approaches for measuring attitudes toward risk (Antle, 1987; Just and Pope,
81 1979). For example, Moscardi and de Janvry (1977) classified these approaches into direct and
82 indirect approaches. They believed that the direct method, developed by von Neumann and
83 Morgenstern, has serious flaws due to the fact that the subjects have different levels of tolerance
84 or intolerance for gambling (the method used to reveal their preferences) and that the concepts of
85 probability are by no means intuitively obvious, more so the method is a time consuming. For
86 these reasons, they proposed and used an indirect approach in their study. In their model, risk
87 was introduced into a model of economic decision making as a safety-first rule.

88 Dillon and Scandizzo (1978) classified the methods of measuring risk behaviors under the
89 following headings: (i) economic anthropology (ii) econometrics (iii) farm risk programming
90 (iv) sectoral risk programming and, (v) expected utility and safety-first theory. They used the
91 expected utility and safety-first theory methods to measure the risk attitudes of subsistence
92 farmers in northeast Brazil. Binswanger (1980) in an attempt to measure attitude towards risk
93 adopted the direct approach based on a modified version of von Neumann-Morgenstern method,
94 or the Equally Likely Certainty Equivalent (ELCE) and the Ramsey or the Equally Likely but
95 Risky Outcome (ELRO) and then used an interview schedule to elicit certainty equivalents and
96 an experimental gambling approach to generate payoffs. He observed that the interview method
97 was subject to interviewer bias, thus his study showed that the interview results were totally
98 inconsistent with the experimental measures of risk aversion. To overcome this difficulty
99 Anderson *et al.*, (1977) introduced several techniques for designing interviews to elicit the
100 preference functions of farmers in their study.

101 In another study, Ellis (2000) used the income variance approach to analyze farmers' production
102 decision behaviour under risk and categorized them as follow:

- 103 - **Risk-preferring/loving/taking:** a person is willing to take the risk of doing better than
104 expected while being aware of the possibility of doing less-well than expected
- 105 - **Risk-neutral:** a risk neutral person is indifferent between certain and uncertain outcomes with
106 the same expected value of income
- 107 - **Risk-averse:** a person is described as being risk averse if he prefers a situation in which a given
108 income is certain to a situation yielding the same expected value for income
109 but which involves uncertainty

110

111 The review of literature suggests that there is no single method that is universally accepted to
112 quantify farmers' attitude towards risk. In this study however, the Equally Likely Certainty
113 Equivalent with a Purely Hypothetical Risky prospect (ELCEPH) model was adopted but

modified to study food crop farmers' attitudes toward risk. The two other techniques that can be used in direct approach interview method are the Equally Likely Certainty Equivalent with a Hypothetical but Realistic Risky prospect (ECLE-R), and Probability of Winning Demanded (PWD).

Conceptual Framework

The study is based on the assumption that farmers' attitude towards risk is linked to the incidence of poverty among farm-households and other socio-economic characteristics. Most importantly it is believed that these factors reinforce each other. For example the farm size, type of crop grown and adoption of modern techniques are closely interrelated. The use of improved farming techniques can lead to increase production, while increased production may provide the additional resources needed to adopt improved farming methods. Similarly, the adoption of improved farming methods and types of crop grown typically influence each other. Meanwhile farm-households' response to risk and uncertain situation in their socio-economic environment may depend to large extent the level of poverty experienced by these households, since the incidence of poverty determines all the other clusters of disadvantages such as constrained access to resources among others, which otherwise would have enabled them to deal appropriately with the risk and uncertainty they face in their production and socio-economic environments. This phenomenon feeds into a dynamic that underscores these households attitude towards risk in the study area. Hence the need to empirically investigate the link between farmers' attitude towards risk and the incidence of poverty in the study area with the hope the findings would inform policy prescription that could adequately equip farmers to cope with the and uncertainty in their socio-economic and production environments.

4. Methodology

4.1 Study Area

The district of Awutu-Senya is the study area and it is located within the coastal savannah ecological zone. The climate here is generally warm and relatively dry with an annual mean rainfall of between 600mm and 1200mm. The vegetation cover is mostly grassland interspersed with shrubs, thickets and trees such as parkia, silk cotton and coconut especially along the coast. Heavy black loamy soil are the soil type found in most part of the district especially at southern portion of the district; while the northern parts are made up of grey loamy soil that supports the cultivation of cereals, legumes, vegetables and root crops mainly cassava. The cultivation of these crops is done mainly on small-scale and under rainfed conditions. The coastal areas of the district are dominated by artisanary fishing activities and some of the fishermen engage in part-time farming cultivating maize, cassava, groundnut and vegetables.

4.2 Sampling Technique and Sample Size

Snow ball sampling technique was used to identify a sample frame of 100 small-scale cassava farmers who had been in farming business for not less than ten (10) continuous cropping seasons. The snowball sampling technique came in handy for this purpose because it was difficult to obtain already generated list of cassava farmers in the district from the Agricultural Extension Directorate under Ministry of Food and Agriculture and also the cassava farmers which this study is interested in are scattered over several communities in the district and not easy to locate hence it was only appropriate to adopt this sampling technique. Using this technique some key informants who themselves were cassava farmers were identified and then interviewed with appropriate research instrument. These persons in turn led to more persons who also interviewed the process continued till the sample frame of 100 cassava farmers was obtained. Thereafter, the simple random sampling technique using the lottery method was employed to select a sample size of 50 cassava farmers who were interviewed. Structured interview schedule was used to collect cross- sectional data from the farmers which were analyzed with the help of Statistical Product and Service Solution (SPSS) soft ware. Data analysis was mainly by descriptive statistics and running of logit regression.

4.3 Data Collection

The data collected were both cross-sectional and secondary. The cross-sectional data were obtained with structured interview schedule which was administered Ministry of Food and Agriculture Extension Officers stationed in the communities where the study was conducted in the districts. Information was elicited from farmers on the socio-economic characteristics of the farmers which were of interest to this study. Secondary data of interest were also obtained from MoFA annual reports, reports from other relevant government agencies and from relevant literature. The information obtained from these secondary sources was used to supplement the cross-sectional data obtained from the interviews

4.4 Data Analysis

The field data generated were analyzed using descriptive statistics, Foster-Greer-Thorbecke (FGT) poverty measure, Equal Certainty Equivalent Risk Model and the Logistic Regression Model (LRM). All the data analysis were carried out using Statistical Product and Service Solution (SPSS) software version 15.0

4.4.1 Measurement of Poverty

The model proposed by Forster *et al.*, (1984) and specified as a general formulation for all facets of incidence of poverty-incidence, depth and severity- as shown below was adopted

$$P_{\alpha} = \frac{1}{n} \sum_{i=1}^q \left(1 - \frac{y_i}{Z} \right)^{\alpha} \quad 1$$

Where:

P - is the poverty index,

α - is a non-negative parameter, which takes the value 0, 1 and 2 and indicates the head count ratio, the poverty gap and the squared poverty gap respectively.

n - is total number of farmers;

q - is the number of poor farm households;

z - is the poverty line relevant to a given income unit and

y_i - is the farm household per capita income.

In this study $\alpha = 0$ and 1 will be considered and they are given as

$$P_0 = \frac{q}{n} \quad \text{(Head count index)} \quad 2$$

$$P_1 = \frac{1}{n} \sum_{i=1}^q \left(\frac{Z - Y_i}{Z} \right) \quad \text{(Poverty gap)} \quad 3$$

to measure the index of poverty among the farm-households in this study. Additionally, it unique property which allows for the disaggregation of the population into specific subgroups, thus allowing for the analysis of a particular group's contribution out of the total population was an added advantage for it adoption in this case.

4.4.2 Assessment of Attitude Towards Risk

Bard and Barry,(2001) suggests that individual's attitude towards risk can take the shape of utility function. For instance, if the utility function has non-negative slope over a range of pay-offs it indicates that more pay-offs are preferred to less. While this is normally true in case of money it may not hold true in case of other things. As suggested as an example by Olarinde *et al.*, (2007), many small scale farmers may enjoy farming for pleasure(a way of life for most

rural in sub-Saharan Africa) but the utility does not always increase with farm size- a large size may be too exhaustive.

In attempt to formalized this phenomenon mathematically Hardaker *et al.*, (1997) presented it as below:

$$U^{(1)}(W) > 0$$

Where $U^{(1)}(W)$ is the i-th derivative of the utility (U) function for wealth (W) (income can be substituted for wealth here) So, if the first derivative of the utility function for wealth is positive (for all W) then it represents the situation where more is preferred to less. Similarly, risk aversion is indicated by a utility function that shows decreasing marginal utility as a level of the pay-off is increased while indifference (neutrality) to risk is represented by a linear utility function. More formally in terms of the second derivative:

1. $U^{(2)}(W) < 0$ suggests risk aversion $CE < EMV$

2. $U^{(2)}(W) = 0$ suggests risk indifference (ie neutrality) ($CE = EMV$), and

3. $U^{(2)}(W) > 0$ suggests risk preference ($CE > EMV$) where CE and ME are certainty equivalence and expected monetary value respectively.

It is however, not feasible to go from the shape of the utility function to some quantitative measure of risk aversion (or preference) without some form of difficulty because of the ordinal scale used for utility (Olarinde *et al.*, 2007). In an attempt to overcome this difficulty this study used the direct approach of measuring attitude towards risk based on von Neumann-Morgenstern (N-M) model, the Equally Likely Certainty Equivalent with a Purely Hypothetical Risky prospect (ELCE-PH). The appeal of this model lies in the fact it has been designed to prevent the bias caused by probability preferences through the use of ethically neutral probabilities (i.e., $P = (1 - P) = 0.5$), thus the subject is confronted with two-state risky prospect having an equal probability of 0.5 for each state. Although this model has the strength of overcoming the criticism of bias due to probability preference, it has its own inherent weakness that is the subject is forced to make a choice between a certainty and lottery. To minimize this problem Anderson *et al.*, 1977 suggested that questions may be presented as practical decision-making problems, hence this was the approach used by this study. Using this approach each farmer was asked to indicate the certain income that he or she would need to be indifferent between receiving certain amount and a lottery with the highest possible win of GH¢1000.00 and the lowest of GH¢100.00, each with a probability of 0.5. The expected value of the lottery was GH¢550.00. So depending on whether

the certain amount was greater than, equal to, or less than the expected value of the risky prospect, each farmer in the sample could be classified as risk preferring, risk neutral or risk averse. The farmers were classified according to their choice into three groups as below:

- Risk-preferring: GH¢55 0.00 < certain amount

- Risk-neutral: GH¢55 0.00 = certain amount

- Risk-averse: GH¢55 0.00 > certain amount

4.4.3 Regression Analysis

Logit regression model was estimated to establish the effect of income as a proxy measure of poverty situations, access to credit, and other socioeconomic variables on farmer's attitude towards risk. The implicit form of the equation is given as:

$$\text{LOGIT: } \log [P_i / (1 - P_i)] = Z\beta + E$$

Where:

Z – represents the matrix of observations of the explanatory variables

β – represents the column vector of the coefficients; and

E – represents a vector of disturbances.

P_i – the probability that a particular condition occurs

Hence the test of the estimated beta (β) coefficients in the model equations were used to draw conclusions on how socio-economic variables influence farmer-risk behaviour.

This equation is further expanded in the estimation as:

$$K = f(\text{Ag, Se, Hhs, Edn, La, Acc, Fip, U})$$

$$K = \beta_0 + \beta_1 Ag + \beta_2 Se + \beta_3 Hhs + \beta_4 Edn + \beta_5 Fs + \beta_6 Acc + \beta_7 Fip + e$$

272

273 Where:

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275 $K = \text{Log}[P_{KA} / (1 - P_{KA})]$ = risk attitude parameter

276 P_{KA} = probability that a farmer is risk-averse

277 Ag = Farmer's age (in years)

278 Se = Sex

279 Hhs = Household size

280 Edn = Educational level of the farmer (in years)

281 Fs = Farm size (in ha)

282 Acc = Access to microcredit

283 Fip = Farm household income below poverty line

284 U/e = random term

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287 RESULTS AND DISCUSSION

288 MEASURING POVERTY SITUATION OF FARMERS

289 This discusses the first objective of the study by measuring poverty situation of farmers.

290 **Table 1: Distribution of respondents by Poverty Groups**

Poverty levels	Income (GH¢)	Frequency	Percent
Very poor	30 – 60	7	14
Poor	61 – 90	22	44
Non poor	91 – 200	21	42
Total	2,095	50	100

291 Source: field data, 2010 n = 50

292

293 The farmers were further classified into three poverty levels on the basis of their income in
 294 relation to the poverty line. The poverty line was chosen as GH¢90 based on the Ghana Living

Standard Survey (GLSS 2000) and the World Banks approach to measuring poverty. Those whose income fall between 1/3 and 2/3 of the poverty line (GH¢30-60) are termed “very poor”, those whose income fall between 2/3 and the poverty line (GH¢ 61-90) are considered as “poor”. Those whose income is greater than the poverty line are considered as “non-poor”. A lower percentage (14%) of the respondent fell into the very poor class. However, the non poor constitute 42% of the farmers, implying that 58% are generally poor.

Analysis using (FGT) poverty measure

Although a large literature on approaches to poverty measurements exists, however, the chosen measure of poverty must be able to capture a range of value judgments on the extent and significance of poverty, at the same time it must be easy to handle and interpret. One set of measures that have been found to be appropriate are those proposed by Foster, Greer, and Thorbecke (1984). The model is specified as

$$P_{\alpha} = \frac{1}{n} \sum_{i=1}^q \left(1 - \frac{y_i}{z} \right) \dots \dots \dots (1)$$

Where P is the poverty index, α is a non-negative parameter, which takes the value 0, 1 and 2 and indicates the head count ratio, the poverty gap and the squared poverty gap respectively. n is total number of farmers; q is the number of poor farm households; z is the poverty line relevant to a given income unit and y_i is the farm household per capita income. In this study $\alpha = 0$ and 1 were considered and they are given as

$$P_0 = \frac{q}{n} \dots \dots \dots (2) \text{ (Head Count Ratio)}$$

$$P_0 = \frac{29}{50} = 0.58$$

$$P_1 = \frac{q}{n} \left(\frac{z - y_i}{z} \right) \dots \dots \dots (3) \text{ (The Poverty gap)}$$

$$P_1 = \frac{29}{50} \left(\frac{90 - 41.89}{90} \right) = 0.31$$

The result from analysis using (FGT) poverty measure shows that the headcount ratio (P_0) is 0.58 implying that about 58 per cent of the respondents in the area are poor. This is close to the current UNDP (2008) publication that over 59.4% of food crop farmers live below the international income poverty line of US\$1 dollar per day while the poverty gap (P_1), which is the mean distance of the income of poor households from the poverty line, was 31%. This gives approximately GHC 48.11 below the poverty line and shows the depth or extent or situation of poverty of cassava farmers in the study area. The mean per capita income of poor households is GHC 41.89.

ANALYSING RISK ATTITUDE OF FARMERS

This section discusses the second objective of the study by analyzing the risk attitudes.

337 **Table 2: Risk attitude of respondents**

Risk Attitude	Frequency	Percent
Risk Neutrality	2	4
Risk Aversion	41	82
Risk Lovers	7	14
Total	50	100

338 Source: field data, 2010 n = 50

339 Using the Equal certainty equivalent risk model (Mike Shor, 1988) which is an econometric
 340 as well as experimental model of assessing risk attitude. Farmers in the study area, during the
 341 interview were asked on individual basis, if they will accept an offer of GH¢ 5000 and stop
 342 producing to avoid the various risk encountered during production. Only 14% said NO with
 343 the reason that they would not accept the money and forgo the production but rather will take
 344 the chance to produce with the view that the accrued profit derived after cultivation will be
 345 more than what is to be collected to forgo production. This makes this category of cassava
 346 farmers under studies being risk lovers. Very few of the farmers were not ready to neither
 347 accept nor reject the offer and stop production making this category of cassava farmers as
 348 risk neutral. Majority of the farmers thus 82% of the farmers said YES to accept the offer and
 349 forgo production with some risk attached which make this category also risk averters. This
 350 confirms earlier studies by Binswanger (1980) in the north west of Brazil which concluded
 351 that cassava crop farmers are risk averse.

352 **Table 3: Risk attitude and Poverty group of respondents**

Risk Attitude	Very Poor	Poor	Non Poor	Total	Percent
Risk Neutrality	0	0	2	2	4
Risk Aversion	7	20	14	41	82
Risk Lovers	0	2	5	7	14
Total	7	22	21	50	100

353 Source: field data, 2010 n = 50

354
 355 The result of the distribution of respondents by risk attitude class and poverty levels with a
 356 crosstab shows a distribution of risk aversion highly skewed towards the risk averters. All the
 357 very poor respondents were also risk averse. This result approves that of Moscardi (1977) for
 358 subsistence peasant's cassava farmers in North East Brazil which shows there were varying
 359 degrees of risk aversion of cassava farmers. Again, 91% of poor respondents showed risk
 360 aversion, while 9% of poor respondent showed risk lover. Considering the distribution in the
 361 non-poor there were 67% of risk aversion, 24% for risk lovers and 9% for risk neutrality.
 362 This implies that there is all the category of risk attitudes in non-poor cassava farmers in the
 363 study area. However; the crosstab could not explain the effect of poverty on risk attitudes of
 364 cassava farmers.

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369 **TABLE 4: EFFECTS OF POVERTY ON RISK USING REGRESSION ANALYSIS**

Independent Variable	Regression Coefficient	Standard Error	T –Value
AGE	-.576*	.003	-.904
HOUSEHOLD SIZE	-.005*	.022	-.208
EDUC. LEVEL	- .011*	.008	-1.366
SEX	.003	.144	6.082
LAND SIZE	- .096*	.039	-2.495
VERY POOR	.140*	.002	7.454
POOR	.140*	.002	7.454
NON POOR	.250*	.003	-8.032
INTERCEPT	0.055*	.011	-2.011
R ²	.484		
ADJUSTED R ²	.454		
F	26.124*		

370 Source: field Data, 2010

371 In order to determine the effect of poverty and other socioeconomic variables on farmers'
 372 attitude towards risk in the area, a regression analysis was run. Of the three functional forms the
 373 semi log model was chosen on the basis of the value of R², and F-value, regression coefficient
 374 and conformity of the parameter with prior expectations. Results of the analysis showed that R
 375 square was 0.484. This implied that 48% of the variation in risk attitude was explained by the
 376 independent variables and standard error of estimate was 0.13139. F-test was significant at 0.05
 377 probability level thus from the “rule of thumb” an F-value of 4 or above shows significance
 378 difference. From the analysis age, household size, educational level, very poor, poor and non
 379 poor were significant at 5% level.

380
 381 With respect to age of the respondents, there are usually no a priori signs for the coefficients due
 382 to the competing hypothesis regarding its effect on risk attitudes, thus it could be positive or
 383 negative. In this study, age was found to be inversely related to risk attitude and statistically
 384 significant at .05% level of probability. This implies that the higher the age of the farmer, the less
 385 risk averse he will be. This supports the findings of Binswanger (1980) who found out that older
 386 people having dealt much more in risky economic games at high stakes might be more willing to

take risks at high levels than young people. Age may also be indexing for the wealth status of the household and accumulation of social capital. Older farmers are more likely to have accumulated more wealth than younger farmers. Moreover older farmers are more likely to have greater social capital and networks, which serve as some form of traditional insurance or fall-back strategies in the process of decision making.

Household size was a significant determinant of risk attitude. There are two opposing interpretations as to the nature of the relationship between household size and risk attitude. The larger the household size, the greater will be the total consumption needs of the farm family and thus, the less willingness to bear risk. However, to the extent that larger household size also augments the total labour supply of the farm household and thereby enhances its income generating potentials, the effect of a larger household size on risk attitude may be neutralized. This study shows a negative relationship between household size and risk attitude coefficient. This implies that majority of the households contribute to household income by supplementing its labour supply especially during peak periods of labour requirement such as harvest and weeding period. This result is consistent with the findings of Moscardi and de Janvry (1977).

Education had an inverse relationship with risk attitude coefficient and was statistically significant. The result conforms to the priori expectation that the more educated respondents will be more willing to bear risk than the less educated ones. This is consistent with the findings of Binswanger (1980) who observed that at low game levels education variable had little influence on risk, but at higher game levels, it generally reduced the level of risk and was often statistically significant. The result also agrees with that of Moscardi and de Janvry (1977) whose findings show that schooling had a positive impact on risk taking though this impact was of no great importance due to the low average level of education in the area.

The variables indicating the poverty situation, namely very poor, poor and non poor were found to be statistically significant and positively related to risk. This implies that holding all other factors constant, the risk coefficient is expected to be higher by 14% and 25% for farmers in poor and non- poor respectively. Thus the lower a household's per capita income or poverty situation becomes poor, the more risk averse they will be. In other words households whose incomes fall below the lower poverty line are more willing to avert risk than the non-poor farmers. This supports the observations of Lamb (2003) and Mosley and Verschoor (2003) that poorer farmers are more risk averse than wealthy ones and as such do avoid prospects in which the probability of failure looms large.

However; there was no significant difference between farmers in poverty situation of very poor and poor group. But there was significance difference between the poor and non-poor thus the more a farmer's per capita income increase above the lower poverty line and above the poverty line respectively, the more such farmers turn to take risk. But farmers who are poor are reluctant to risk neutrality and highly pose to avert risk. This finding also confirmed earlier research conducted by Coulambe and Wodon (2007) which states that non-poor farm households are more risk prefers or takers and turn to be oblivious in deciding in risk attitude, sometimes making them rather risk neutral instead of risk averse.

Conclusions

- The result showed that more than half of farmers in the area were poor and the depth or extent of poverty was one out of three of the respondents, using (GLSS 2000) of GH¢ 90 as poverty line. Though majority of farmers in the study area were poor they get the largest portion of their income from farming activities and therefore any poverty alleviation strategies should be geared towards farming activities.
- Furthermore, the study revealed that (using the equal certainty equivalent risk model of assessing farmers risk attitudes) more than four out of five of the farmers were risk averse, few were risk lovers and very few were risk neutral. This show the risk attitude of the respondents.
- Result of multiple regressions also showed that age, household size, educational level and degree of poverty were significant determinants of risk attitudes. However; poverty groups were found to be statistically significant and positively related to risk.
- The risk coefficients are shown to be significantly related to a set of important socio-economic and poverty variables that characterize cassava farmers. This underscores the need to consider the socioeconomic and poverty characteristics of the farmer, and its associated attitudes and behaviour towards risk-taking, when designing new farm technologies and other agricultural policies in Awutu Senya District and in Ghana at large. Such technological and institutional packages if optimally tailored to peasants' economic behaviour will greatly enhance the chances of success of rural development interventions and programmes.

Recommendations

- Government through MIDA and other initiatives should contribute in reducing poverty by implementing the objective of the Ghana poverty reduction programme (I and II) thus improve rural income by focusing on improving the quantity of produce and by increasing the farm gate price.
- Financial assistance should be provided by rural Banks and NGO's to help cassava farmers to adopt and use required inputs which will help increase their yield potential.
- Insurance companies should consider developing crop insurance products for farmers to patronize and use as a cushion to protect farmers against uncertainty events
- Farmers should improve on their risk management strategies to help mitigate risk.

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