SOCIO-ECONOMIC FACTORS THAT INFLUENCE ADOPTION OF CROP INSURANCE AMONG FARMERS IN LUSAKA PROVINCE, ZAMBIA

A Research Report presented to the Department of Agricultural Economics of the University of Zambia.

BY

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In Partial Fulfillment of the Requirements for the Degree of Bachelor of Agricultural Science

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Finally, I want to thank all my friends and course mates for the help they offered to me when I needed them and for making my stay at campus a wonderful experience.
ABSTRACT

Socio-economic Factors that Influence Adoption of Crop Insurance among Farmers in Lusaka Province, Zambia

Bwile Martha Musonda
University Of Zambia, 2012

The agriculture sector is characterized by a strong exposure to risk. Unlike the industrial sector, it is subject to the vagaries of the weather. The variations in productivity induced by nature cannot be fully accommodated by farmers. Since time in memorial, farmers have devised measures to limit these risks such as; crop rotation and diversification, inter-cropping, use of low yield but hardy varieties and the development of non-farm sources of income. While these measures continue to be helpful, the problem of residual risks remains. The modern insurance sector can play a major role here, and considerably strengthen the security of farmers. Incidence of risk in agriculture is important to policy makers. Fluctuations in producer’s income and the threat of catastrophic losses in particular can present difficult welfare problems for producers and national governments. The purpose of this study was to identify the socio-economic factors that influence the adoption of crop insurance among farmers in Chongwe and Makeni farming areas in Zambia’s Lusaka Province.

The sample size was 78 respondents and questionnaires were used to collect data. The probit model was employed to analyze and discuss the social and economic factors. The factors studied included household size, crop insurance knowledge, farming experience, credit use, age, education level, adequate access to knowledge on crop insurance, farm size, knowledge on premium rates, monthly income, land ownership, non farm income and the scale of farming. The factors which were identified as being statistically significant at 95% confidence level (with the probit model) were; household size (P-value = 0.006), crop insurance knowledge (P-value = 0.000), farming experience (P-value = 0.001), credit use (P-value = 0.034), age (P-value = 0.037) and education level (P-value = 0.011).

Descriptive statistics were also employed to look at the challenges faced by farmers in accessing crop insurance. The results of the study showed that the amount of paper work involved in accessing crop insurance, lack of visits by insurance extension officers, inadequate access to information on crop insurance and the long distance from farm area to the nearest insurance company were the major challenges faced.

The recommendations were that insurance companies should work on sensitizing farmers on crop insurance so as to improve their understanding of the program of insurance and also to improve linkages between insurance companies and banks and other organizations.
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CHAPTER ONE
INTRODUCTION

1.1 Background

Agriculture is associated with a high number of risks. The situation is worsened by increasing threats posed by climate change and environmental degradation. The most common of these risks are production, marketing and financial risks. Production risks are the risks faced by farmers during the production stage such as; floods, droughts and fire. Production risks are a result of the biological nature of agriculture products, the weather and technology. Marketing risks are those risks encountered when marketing the product such as changes in the prices of both the inputs and outputs. Marketing risks arise due to the fact that farmers are price takers in a competitive market with little or no control over the market forces of supply and demand. Financial risks refer to risks a farmer might face such as failure to pay back a loan and failure to access funds when needed. These risks are a result of, among others, the variability of interest rates and unwillingness to lend money by lenders. All these events severely affect farmers through loss in production and farm income, and they may be beyond the control of the farmers. With the growing commercialization of agriculture, the magnitude of loss due to unfavorable eventualities is increasing. A number of agriculture management tools and strategies have been developed in order to mitigate these risks. These include; agriculture insurance, that is crop insurance and livestock insurance, enterprise diversification and forward contracting.

The aim of this study was to analyze the factors that influence the adoption of crop insurance by farmers as a method of mitigating risks associated with agriculture. Insurance refers to the financial protection against harm or loss. Crop insurance is purchased by agricultural producers in order to protect themselves against either the loss of their crops due to natural disasters, such as, drought and floods, or the loss of revenue due to declines in the prices of agricultural commodities. Generally, there are two types of crop insurance schemes; single and multi-peril coverage. Single peril coverage offers protection from a single hazard while multiple-peril provides protection from several hazards.
There are a number of insurance companies that provide crop insurance in Zambia. These include Zambia State Insurance Corporation, Madison Insurance, Budget Insurance, Diamond Insurance and Professional Insurance. Zambia State Insurance Corporation (ZISC) first introduced the crop insurance scheme in the 1979-1980 farming season. It is still in operation up to date and provides single peril and multi peril covers. With the liberalization of the economy in 1991, private insurance companies such as Madison Insurance, Budget Insurance, Diamond Insurance and Professional Insurance also came on board. It must be stated here that the insurance companies named only cover production risks. This means that no insurance against marketing and financial risk is currently being offered. However, little is known about the factors that influence the adoption of crop insurance by farmers in Zambia. In addition, the adoption of crop insurance as a risk mitigation tool by farmers appears to be low.

1.2 Problem Statement

Agriculture is a dominant sector in Zambia. It accounts for a major share of the country’s Gross National Product and is the primary source of informal employment for most of the rural based citizens in the country. However, agriculture is still characterized by low levels of income, low capital-labour ratios and the general instability of agricultural production despite the various initiatives taken for its development.

Agriculture is a very risky prospect. This is because it is affected by the vagaries of the nature, such as droughts and floods. Susceptibility of agriculture to these disasters is compounded by the outbreak of epidemics and man-made disasters such as fire, sale of spurious seeds, fertilizers and pesticides, price crashes, to mention but a few. Crop yield uncertainty is thus one of the basic risks confronted by farmers. Over 50% of the farmers in Zambia are small scale farmers with extremely limited means and resources and are, therefore, unable to bear the risks of crop failure. Agriculture contributes an average of 18% to the GDP, (Central statistics office, 2010) and any disturbance in its production has a multiplier effect on the Zambian economy. Since, economic growth and agricultural growth are inextricably linked to each other, managing risks in agriculture is a big challenge to the policy makers and the researchers. The risk aversion induces underinvestment in
agriculture, leading to inefficiency. While it is a fact that most of the agriculture risks in Zambia can be removed by technical measures such as irrigation, crop rotation, enterprise diversification and by improvements in marketing and institutional set-up, the variability of risks, however, reduces the effectiveness of these measures. The insurance sector can play a major role by;

1) Stabilizing agricultural production or farmer’s income by reducing adverse effects resulting from crop losses due to natural hazards.
2) Encouraging farmers to adopt improved technologies which can lead to increased production and more efficient use of inputs/resources.
3) Encouraging farmers to diversify into more profitable but risky ventures.
4) Helping farmers have a better credit rating required to get financial loans

Though crop insurance is an effective risk management tool, it appears that very few farmers have actually adopted it in Zambia. Why is this the case?

1.3 General Objective

To determine and analyze the factors that influence the adoption of crop insurance as a risk management tool by farmers in Chongwe and Makeni farming areas in Lusaka province.

1.3.1 Specific Objectives

➢ To analyze the challenges faced by farmers in accessing crop insurance
➢ To identify the socio-economic factors which significantly influence the adoption of crop insurance
1.4 Rationale

The study results will provide a better understanding of which farmer/farm characteristics influence the use of agriculture as a risk management strategy. This information should be valuable to policy makers, government agencies (such as the Disaster Management Unit), insurance companies, and extension officers. For example, an awareness of which type of producer is more likely to adopt crop insurance would help insurance companies to better identify potential clientele. This information should also help extension educators target producers that need crop insurance or risk management education the most.

1.5 Organization of the Report

This thesis begins with chapter one which highlights the background information on the subject matter. It covers the problem statement, objectives and rationale of the study. Chapter two focuses on literature review in which the meaning crop insurance and it’s definition, the reasons for crop insurance, the difficulties in crop insurance and the factors likely to influence adoption of crop insurance are discussed. Chapter three looks at the methodology that was used for the study. It encompasses the research design, description of the data collection procedure, sampling design and data analysis. Chapter four highlights the findings and interpretation of the findings of the study, while chapter five looks at conclusion and recommendations based on the findings of the study.
CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter discusses the meaning and definition of crop insurance. It then highlights the major factors that necessitate crop insurance, reasons why insurance is difficult and the factors likely to affect adoption of crop insurance.

2.2 Meaning and Definition of Crop Insurance

Crop insurance is the type of insurance that provides financial compensation for production or revenue losses resulting from specified or multiple perils, such as hail, windstorm, fire, droughts or flood. Most crop insurance pays for the loss of physical production or yield. Coverage is also often available for loss of the productive asset, such as trees in the case of fruit crops (Olivier Mahul and Charles J. Stutley, World Bank report, 2010).

Crop insurance is where under some insurable conditions, the insurance company allows an individual to turn a future and an uncertain expenditure (loss), which is usually high into an anticipated, certain and lower expenditure (premium), (Booth et al., 1999).

2.3 Reasons for Crop Insurance

Crop insurance has been used in a variety of forms and purposes in more than 70 countries, according to an FAO survey published in 1991. In particular, developing countries have established crop insurance programs not only to provide farmers with another risk management tool, but also to promote other goals, such as improving farmers' access to credit, promoting
production of high value crops that might also have higher yield risk and providing more stability to agriculture and related industries (Vandeveer, 2001).

2.4 **Difficulties in Crop Insurance**

Due to the increased complexity and variation in agriculture risk, farmers find it very difficult in making rational decisions when faced with risks. Crop insurance is one of the solutions that farmers can use when faced with risks. On the other hand, farmers that are faced with many problems adopt the innovation of crop insurance. This decision-making process consists of a series of actions and choices over time, through which a farmer evaluates an innovation and decides whether to incorporate it into his ongoing practices. Due to the diversity of social, economic and natural factors influencing the adoption of an innovation, making such a decision is not a simple process. Interference by the private sector and government polices (subsidized prices, low interest loans and extension campaigns) add to the complexity of the decision making process. In addition, several problems inhibit the development of crop insurance, moral hazard (Goodwin and Smith 1998), adverse selection (Goodwin, 1994 and Quiggin et al., 1994), systemic risk (Miranda and Glauber, 1997) and the absence of long-term data on agricultural yield and actuarial methods to accurately calculate the fair premium rate.

2.5 **Factors Likely to Influence the Adoption of Crop Insurance**

Several studies have highlighted the factors that influence the adoption of crop insurance. Some of these studies are;

1) A study on factors that affect the adoption of crop insurance (Makki and Somwaru (2001)) The researchers of this study analyzed data from producer decisions over a five-year period from 1995 to 1999 and identified factors that influenced crop insurance choices. Their findings indicate that the following factors affect the adoption of crop insurance; Risk level; the higher the risk level, the higher the chances of adoption, Price; the higher the price of insurance, the lower the chances of adoption, Federal Subsidization; the higher the
subsidization, the higher the chances of adoption. Expected Indemnity Payoffs; the higher the expected indemnity pay off, the higher the chances of adoption, availability of alternative insurance products and characteristics of the contract.

2) In 1997, Knight and Coble prepared a survey of agricultural economic literature, summarizing research conducted on crop insurance from 1980 to 1997. In their paper, Knight and Coble examined econometric research conducted at the aggregate and farm levels. In summary, Knight and Coble presented three propositions “supported by a preponderance of evidence” from the econometric studies on crop insurance participation which they reviewed: As farm size increases, participation increases. Diversification reduces participation. Yield variability and income risk increase participation.

3) The findings of the paper: Index Based Agricultural Insurance in Developing Countries: Feasibility, Scalability and Sustainability by Vincent H. Smith and Myles Watts (2000) show that studies of crop insurance demand and participation suggest that agricultural insurance programs are likely to be more successful in environments where; yields are more volatile, farmers are better educated, debt is a concern and premium rates are subsidized.

4) Ghadirian and Ahmadi (2002) in their study titled the tendency for Soya’s insurance from Golestan province in Iran to work showed that factors such as age of beneficiaries, farm size, diversity of products, level of insurance of other crops and previous records of risk in Soya’s farms have negative influence on the propensity and elasticity of farmers related to Soya insurance, while the amount of credits which have been received by farmers, had positive effect on the propensity of farmers to purchase insurance.

5) Another study, titled ‘Factors influencing farmers’ crop insurance decisions’ by B. Sherrick, P. Barryand, P. Ellinger and G. Schnitkey (1998), showed the following results:
Level of Business Risk; Producers facing greater levels of insurable risk are expected to have stronger demand for crop insurance and greater utilization of more comprehensive insurance products.

Risk Management Options; Farmers have numerous risk management options available to mitigate the effects of crop yield or revenue variability. Although numerous methods exist for recovering indicators of risk attitudes and risk preferences, self-assessed strength of agreement or strength of rating scales have been shown to be reliable and valid, and are thus most commonly used (Pennings and Garcia, 2000). Furthermore, it is generally agreed that respondents should view choices as relevant and serious, and not artificial or inconsequential, and be answerable with little effort (Weber and Milliman, 1999). The list of alternative risk-management items was developed with focus group input from farmers to insure that meaningful and realistic alternatives were provided for the respondents.

Debt Use; Greater use of debt by farmers, evidenced by use versus nonuse of debt or by higher debt-to-asset ratios, indicates greater financial risk and a stronger demand for more comprehensive insurance products. Thus, a positive relationship is anticipated between financial leverage and use of crop insurance.

Age and Education; Insurance users in general, and revenue insurance users in particular, are expected to be more experienced and better educated, indicating a greater responsiveness of insurance use to modern, more sophisticated approaches to risk management. Such attributes may lead to greater precision in risk assessments and to possible changes in risk attitudes that complement improved risk carrying capacities.

Tenure; Greater reliance on ownership versus leasing of farmland often reflects greater wealth positions of farmers and greater stability of land control. In turn, greater wealth and less tenure risk similarly reflect stronger risk bearing capacities and greater reliance on self-insurance relative to commercial insurance. Thus, a high ratio of owned acres to total acres...
operated similarly is associated with nonuse of insurance and a preference for greater specificity in type of insurance product (i.e., hail over yield over revenue insurance).

Expected Yield; Expected yields were determined by eliciting the survey respondent's subjective yield distributions based on the conviction weight method in which the farmers assigned probabilities to six categories of yield levels (Hardaker, Huirmne, and Anderson, 1997). The probabilities in each category were used to fit to a Weibull distribution for each farmer, and the expected yield calculated. Differences in expected yields may serve as an indicator of differences in soil quality and/or farmers' management abilities. Generally, higher quality soil is associated with lower relative yield variability, although the self-perceptions of yield risk utilized in this study are expressed in the "Level of Risk" variable. Thus, differences in expected yield largely reflect differences in farmers' management abilities and return potentials, with greater management ability associated with greater probabilities for using insurance.

Farm Size and Expansion Intentions; Insurance users are expected to operate larger farm sizes, and to have intentions for further expansions. They may also have a greater number of landlords and farm locations, or anticipate higher future leverage and a commensurate need to reduce business risk. In general, larger sizes reflect greater managerial capacities and perhaps economies of size in the utilization of various risk management practices.

Livestock Enterprises and Non farm Income; The undertaking of both livestock and crop production, and the reliance on off-farm income by the farmer and/or spouse represent forms of diversification that would be expected to contribute to the stability of overall income and, thus, reduce the demand for crop insurance. Conversely, if a significant portion of the crop production is intended for feed, the motivation to use insurance to protect against yield/feed shortfalls may be greater.
2.6 Conceptual Framework

The two models used in adoption studies are the Logit and Probit models both of which are convenient for dichotomous adoption variables. Probit is particularly well suited to experimental data while Logit model is for observational data (Rahm and Huffman, 1984).

Probit model will be used to avoid having to work with negative dependent variables and assuming non-linear effects of the explanatory variables. Also, the Probit model discriminate better near median potency (i.e. probability of response) and is more appropriate when the binary dependent is assumed to represent a normal distribution. This model is a popular specification of a generalized linear model, using the probit link function.

The Probit model was specified as follows: $Pr(Y=1|X = x) = \Phi (x \beta)$. Where: $\beta$ is a parameter to be estimated, and $\Phi$ is the normal cumulative distribution function (CDF). $Y_i$ is the dependent binary or variable;

- $Y=1$ adoption of crop insurance
- $Y=0$ non adoption of crop insurance

$X_i$ represents the vector of independent variables that affect $Y_i$. The variables hypothesised as factors influencing adoption of crop insurance include:

- $X_1$ Farmers’ age
- $X_2$ Level of education
- $X_3$ Gender
- $X_4$ Land ownership
- $X_5$ Farming experience
- $X_6$ Size of farming area
- $X_7$ Off farm income
- $X_8$ Knowledge about crop insurance
- $X_9$ Income from farming per month
- $X_{10}$ Debt use
- $X_{11}$ Knowledge about premium rates
CHAPTER THREE

RESEARCH METHODS

3.1 Introduction

This chapter outlines the methods and procedures used to achieve the stated goals. It gives information on the area of study, research design, sampling procedure, data collection and data analysis tools that were used in the study.

3.2 Area of Study

This study was conducted in Chongwe district and Makeni farming area of Lusaka district. These areas were selected because they comprise both small scale and large scale farmers who have settled there from various urban areas.

3.3 Research Design

The research design that was used is a non experimental research design. A non experimental research design was selected because the farmers in the target areas were not divided into groups based on their similarities i.e. control and target groups but rather were considered as being part of one group.

3.4 Study Population and Sampling Procedure

A sample of 78 respondents was purposively sampled from the two farming areas, and a farm household was used as the sampling unit.
3.5 Data Sources and Collection Technique

In this study, both primary and secondary data were used. Primary data was collected from the farmers using structured questionnaires. This technique was selected because of the researcher's desire for quantitative data, which were analyzed statistically using computer software. Secondary data was collected from various organizations such as Professional Insurance, Zambia State Insurance Corporation, online resources and other relevant publications.

3.6 Data Analysis

The field data was analyzed in SPSS to produce descriptive statistics. The data was tested for potential heteroskedasticity using the Breusch-Pagan Godfrey test, which may be present across households due to the use of cross sectional data. Heteroskedasticity was significant at 5% level. This was corrected for by running a probit model in STATA, using robust standard errors. The average multicollinearity was found to be 1.49, by far less than 10. Thus, the data was free from multicollinearity.

3.7 Limitations of the Study

In this research, a sample size of 80 farmers was supposed to be purposely sampled from Makeni and Chongwe district. However, only 78 of these farmers were interviewed. Some of the challenges faced in the data collection exercise were that very few farmers in these areas had adopted insurance and it was therefore difficult to get a good mix of both adopters and non adapters of crop insurance. In order to make up for this deficit, some respondents were purposively sampled from among SARO Agro Industrial Limited Company farmers. These respondents were farmers from Mkushi, Chisamba and Lusaka West. Another challenge faced was the fact that some farmers have low literacy levels and it was therefore difficult to gather information from them using the questionnaire.
CHAPTER FOUR

STUDY FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents and discusses the study findings. It begins with a presentation and discussion of the demographic characteristics and also highlights the challenges faced by farmers in accessing crop insurance. The aspects influencing farmers in adopting insurance such as farming experience, credit use and knowledge about crop insurance are then presented and discussed. The chapter then concludes with a discussion on the results of the probit model analysis.

Table 1 below shows that out of the seventy eight of the sampled households, over 62% were male with the remaining being female headed farm households. There are more males because only the household head in each household was the respondent implying that females were respondents only in female headed households.

Table 1: Distribution of Farmers by Sex

<table>
<thead>
<tr>
<th>Sex</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>48</td>
<td>61.5</td>
</tr>
<tr>
<td>Female</td>
<td>30</td>
<td>38.5</td>
</tr>
<tr>
<td>Total</td>
<td>78</td>
<td>100.0</td>
</tr>
</tbody>
</table>
The majority of the respondents fell in the 30-39 years age range, with 27% in the 40-49 age range while 30% were above 50 years of age as shown in table 2.

<table>
<thead>
<tr>
<th>Age</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 – 39</td>
<td>33</td>
<td>42.3</td>
</tr>
<tr>
<td>40 – 49</td>
<td>21</td>
<td>26.9</td>
</tr>
<tr>
<td>&gt; 50</td>
<td>24</td>
<td>30.8</td>
</tr>
<tr>
<td>Total</td>
<td>78</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The majority of the respondents had attained tertiary level of education (53%), and secondary level of education (46%), with only one respondent having attained primary level of education. Analysis of this information showed that some of the respondents stated that they had attained tertiary education based on the fact that they had undergone some training or workshop in farm management by the Ministry of Agriculture and Cooperatives or by a Nongovernmental Organization. This information is shown in table 3.

<table>
<thead>
<tr>
<th>Education</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>Secondary</td>
<td>36</td>
<td>46.2</td>
</tr>
<tr>
<td>Tertiary</td>
<td>41</td>
<td>52.6</td>
</tr>
<tr>
<td>Total</td>
<td>78</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Table 4 shows that the majority (86%) of the respondents was small scale farmers, and the remaining 14% were large scale farmers.

Table 4: Distribution of Farmers by the Scale of Farming

<table>
<thead>
<tr>
<th>Scale of Farming</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>small scale</td>
<td>67</td>
<td>85.9</td>
</tr>
<tr>
<td>large scale</td>
<td>11</td>
<td>14.1</td>
</tr>
<tr>
<td>Total</td>
<td>78</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The majority of the respondents (45%) had land in the range 5-10 hectares. 39% of the respondents having less than 5 hectares of farming area, 9% of the respondents had between 10 and 15 hectares while 8% of the respondents had more than 15 hectares of farming land.

Table 5: Distribution of Farmers by Size of Farming Area in Hectares

<table>
<thead>
<tr>
<th>Size of Farming Area (Ha)</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 5</td>
<td>30</td>
<td>38.5</td>
</tr>
<tr>
<td>5-10</td>
<td>35</td>
<td>44.9</td>
</tr>
<tr>
<td>10-15</td>
<td>7</td>
<td>9.0</td>
</tr>
<tr>
<td>&gt;15</td>
<td>6</td>
<td>7.6</td>
</tr>
<tr>
<td>Total</td>
<td>78</td>
<td>100.0</td>
</tr>
</tbody>
</table>
The majority of farmers (51%) had farming experience between 6 and 10 years. With 5% of the farmers having less than 5 years of farming experience, 23% of the farmers had between 10 and 15 years of experience while 21% of the farmers had farming experience of more than 15 years. This information is represented in table 6.

Table 6: Distribution of Farmers by Farming Experience in Years

<table>
<thead>
<tr>
<th>Experience in Years</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5</td>
<td>4</td>
<td>5.1</td>
</tr>
<tr>
<td>6-10</td>
<td>40</td>
<td>51.3</td>
</tr>
<tr>
<td>10-15</td>
<td>18</td>
<td>23.1</td>
</tr>
<tr>
<td>&gt;15</td>
<td>16</td>
<td>20.5</td>
</tr>
<tr>
<td>Total</td>
<td>78</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 7 shows that the majority of respondents (50%) had household sizes of less than 5 people, 39% had household sizes between 5 and 10 people and 12% had household sizes between 10 and 15.

Table 7: Distribution of Farmers by Household Size

<table>
<thead>
<tr>
<th>Household Size</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5</td>
<td>39</td>
<td>50.0</td>
</tr>
<tr>
<td>5-10</td>
<td>30</td>
<td>38.5</td>
</tr>
<tr>
<td>10-15</td>
<td>9</td>
<td>11.5</td>
</tr>
<tr>
<td>Total</td>
<td>78</td>
<td>100.0</td>
</tr>
</tbody>
</table>
The majority of respondents (54%) had knowledge on crop insurance while 46% had no knowledge in crop insurance as shown in the table 8 below.

**Table 8: Distribution of farmers by Crop Insurance Knowledge**

<table>
<thead>
<tr>
<th>Knowledge on Crop Insurance</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>42</td>
<td>53.8</td>
</tr>
<tr>
<td>No</td>
<td>36</td>
<td>46.2</td>
</tr>
<tr>
<td>Total</td>
<td>78</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 9 shows that only 9% of the respondents used credit while the majority (91%) did not use credit.

**Table 9: Distribution of Farmers by Credit Use**

<table>
<thead>
<tr>
<th>Credit Use</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>7</td>
<td>9.0</td>
</tr>
<tr>
<td>No</td>
<td>71</td>
<td>91.0</td>
</tr>
<tr>
<td>Total</td>
<td>78</td>
<td>100.0</td>
</tr>
</tbody>
</table>
4.2 Challenges Faced by Farmers in Accessing Crop Insurance

This section presents the descriptive statistics on the major challenges that are faced by farmers in trying to access crop insurance.

The majority of respondents (92%) thought there was too much paper work involved in accessing crop insurance while only 8% responded negatively as shown by table 10.

Table 10: Farmers Perception on the Amount of Paper Work Involved in Accessing Crop Insurance

<table>
<thead>
<tr>
<th>Excess Paper Work</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>72</td>
<td>92.3</td>
</tr>
<tr>
<td>No</td>
<td>6</td>
<td>7.7</td>
</tr>
<tr>
<td>Total</td>
<td>78</td>
<td>100.0</td>
</tr>
</tbody>
</table>
The respondents were asked if they thought they had access to adequate information on crop insurance. The majority of respondents (91%) responded negatively while only (9%) responded positively. This information is represented in table 11.

Table 11: Access to Adequate Information on Crop Insurance

<table>
<thead>
<tr>
<th>Access to Adequate Information on Crop Insurance</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>7</td>
<td>9.0</td>
</tr>
<tr>
<td>No</td>
<td>71</td>
<td>91.0</td>
</tr>
<tr>
<td>Total</td>
<td>78</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The respondents were asked how often they were visited by extension officers or agents from the insurance companies. All the 78 respondents responded that they had never been visited.

Table 12: Frequency of Visits by Insurance Extension Officers

<table>
<thead>
<tr>
<th>Visits By Insurance Extension Officer</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>78</td>
<td>100.0</td>
</tr>
</tbody>
</table>
The respondents were asked if they thought they had access to adequate information on crop insurance. The majority, (91%) responded negatively while only 9% responded positively. This information is shown in table 13.

### Table 13: Access to Adequate Information on Crop Insurance

<table>
<thead>
<tr>
<th>Access to Adequate Information on Crop Insurance</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>7</td>
<td>9.0</td>
</tr>
<tr>
<td>No</td>
<td>71</td>
<td>91.0</td>
</tr>
<tr>
<td>Total</td>
<td>78</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The respondents were asked what the distance was from their farm area to the nearest insurance company. The majority (99%) of the farmers responded that their farms were more than 100Km from the nearest insurance company while only 1% of the farmers responded that their farm was less than 50Km from the nearest insurance company.

### Table 14: Distance from Farm Area to the Nearest Insurance Company

<table>
<thead>
<tr>
<th>Distance</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>within 50km</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>More than 100Km</td>
<td>77</td>
<td>98.7</td>
</tr>
<tr>
<td>Total</td>
<td>78</td>
<td>100.0</td>
</tr>
</tbody>
</table>
4.3 Probit Regression Model

The probit model was estimated using maximum likelihood estimator in STATA and data collected from the sample survey. The model was tested for multicollinearity and heteroskedasticity before running it. The variance inflation factor, VIF was used to test for multicollinearity. The average VIF for all variables was 1.49. 1.49 is by far less than 10. Thus, the model was free from multicollinearity. The Breusch- Pagan was used to test for heteroskedasticity. The probability was greater than the $\chi^2 = 0.0041$. 0.0041 < 0.05, therefore heteroskedasticity existed. Robust standard errors were used to correct for heteroskedasticity.

The table presents the probit regression (adjusted for heteroskedasticity) variables for the adoption of crop insurance. The dependent variable is the area allocated to other crops other than maize.

![Table 15: Probit Regression Parameter Estimates for factors influencing adoption of crop insurance (Dependent Variable: Crop insurance use)](image)

Source: Results Based on Calculations  
Note: significance level= 5%
The table above presents the results for the probit model analysis. The results show that the adoption of crop insurance is significantly influenced by the variables; household size, crop insurance knowledge, experience, credit use, age and education level. These variables were statistically significant at 95% confidence level. The other variables; adequate access to knowledge on crop insurance, non crop enterprises on the farm, farm size, knowledge on premium rates, monthly income, land ownership, non farm income and the scale of farming were not statistically significant at 95% confidence level.

Household size: The results showed that the marginal effect for household size was negative. This shows that an increase in the household size by 1 unit, that is, by one person reduces the probability of a farmer adopting crop insurance by 23%. Larger households usually have higher expenditures than smaller households. The high expenditures lead to reduced incomes. Generally, farmers with low incomes are less likely to adopt insurance because they have higher priorities. This is shown by the marginal effect for income, which is positive showing that a decrease in income by one kwacha decreases the probability of a farmer adopting crop insurance by 31%.

Knowledge of Crop Insurance: The marginal effect for crop insurance knowledge was positive. This shows that a farmer who has knowledge of crop insurance has a 22.2% probability of adopting crop insurance. A farmer who has adequate knowledge on crop insurance is expected to be more likely to adopt insurance because he or she knows the advantages and disadvantages and is therefore better able to use this information to the best of his or her interests.

Years of Farming Experience: The number of years of farming experience had a positive marginal effect. This shows that an increase in a farmers experience by 1 year will increase the probability of the farmer adopting crop insurance by 15%.

Credit Use: Credit use had a positive marginal effect. This indicates that farmers that use credit have a 21% probability of adopting crop insurance unlike those that did not use any credit. Greater use of credit by farmers, evidenced by use versus nonuse of credit or by higher debt-to-asset ratios, indicates greater financial risk and a stronger demand for more insurance. This result is consistent
with the research findings by B. Sherrick, P. Barryand, P. Ellinger and G. Schnitkey (1998).

Farmers Age: The marginal effect on age was also positive, indicating that a 1 year increase in the age of the farmer would increase the probability of a farmer adopting crop insurance by 4%. Older farmers are more likely to adopt crop insurance because of the increasing consciousness and self realization of the importance that comes with age. This is consistent with the research findings by B. Sherrick, P. Barryand, P. Ellinger and G. Schnitkey (1998).

Education: Education also had a positive marginal effect. This shows that a one year increase in number of years of education of the farmer's would increase the probability of a farmer adopting crop insurance by 5%. More educated farmers are expected to indicate a greater responsiveness in the use of modern, more sophisticated approaches to risk management because they have better understanding of these approaches. These results are consistent with a lot of research findings, such as the results by Ghadirian and Ahmadi (2002), Smith and Baquet (1996)

Descriptive statistics were used to determine the challenges faced by farmers in accessing crop insurance. The study showed that the following were the major challenges:

Farmers’ perception on the amount of paper work involved in accessing crop insurance. Insurance companies are very cautious when providing their services. A lot of screening is involved in order to reduce moral hazards and adverse selection. Adverse Selection is a situation in which potential insurance purchasers know more about their risks than the insurer does, leading to participation by high-risk individuals and nonparticipation by low-risk individuals. Moral hazard problems are generated when the insured’s behavior can influence the extent of damage that qualifies for insurance payouts. Examples of moral hazard are carelessness and irresponsibility. The process of screening is usually very long and involves a lot of paper work. Generally, farmers are very busy people and may have some literacy problems. Thus, the amount of paper work involved in the process of trying to access insurance poses as a great challenge.
Access to adequate information on crop insurance. Although, most of the farmers had heard about crop insurance from friends and family, the media or from extension officers from the ministry of agriculture, they still stated that they did not have adequate access to information on crop insurance. It is very imperative that farmers have access to all the information on crop insurance so that they can make an informed decision on whether to adopt it or not to. Farmers are rational people and therefore they would not adopt insurance based on limited information.

Frequency of visits by insurance extension officers. Despite the availability of several insurance companies, it appears that the companies have very few insurance extension officers. An insurance extension officer is a person who solicits, negotiates, or implements insurance contracts on behalf of the insurance company. Therefore, the farmers are not visited. The lack of visits from the insurance agents is a challenge to the farmers because they do not have anyone to consult from on matters of crop insurance that they are not clear about.

Finally, the distance from the farmers farming area to the insurance companies is also a challenge. Most of the insurance companies are located in the central business centers in Lusaka. This means that the farmers have to cover a distance of at least 100Km in order to reach the nearest company. The distance also poses as a challenge.
CHAPTER FIVE
CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the conclusion and recommendations of the study based on the findings and interpretations of the study.

5.2 Conclusions

Agriculture remains a source of livelihood for almost half of humanity. It is also a source of growth for national economies and can be a provider of investment opportunities for the private sector. However, millions of poor people face prospects of tragic crop failure or loss when, as a result of climate change, rainfall patterns shift or extreme events such as drought and floods become more frequent. Crop insurance is key in assisting farmers and governments lessen the negative financial impact of these adverse natural events. However, the results show that most of the farmers in Chongwe and Makeni farming areas have not adopted crop insurance.

This study was designed to determine the factors that influence the adoption of crop insurance by farmers. The probit model was employed to analyze and discuss the social and economic factors. The factors studied included household size, crop insurance knowledge, farming experience, credit use, age, education level, adequate access to knowledge on crop insurance, farm size, knowledge on premium rates, monthly income, land ownership, non farm income and the scale of farming. The factors which were identified as being statistically significant at 95% confidence level (with the probit model) were; household size, crop insurance knowledge, farming experience, credit use, age and education level The significance of each of these variables was discussed to reveal its influence on adoption decisions.

Descriptive statistics were also employed to look at the challenges faced by farmers in accessing crop insurance. The results of the study showed that the amount of paper work involved in
accessing crop insurance, lack of visits by insurance extension officers, inadequate access to information on crop insurance and the long distance from farm area to the nearest insurance company were the major challenges faced.

5.3 Recommendations

Insurance companies should work on sensitizing farmers on crop insurance. This should be done by sending extension officers to different farming areas so that the farmers can have a chance to find out as much information as possible on crop insurance. Farmers must be convinced that the program is in their interest. Farmers should feel that the terms and conditions of insurance are fair, and have the confidence that claims would be settled in time. All this can only happen once the farmers have full information on crop insurance. In addition, the paper work involved should be kept to a minimum so as not to discourage or intimidate farmers from taking on crop insurance. Communication with farmers is therefore an important element as an insurance company tries to incorporate more farmers onto their crop insurance program. This may be through mass media, education programs and group interactions.

Improving farmer’s understanding and trust of insurance is key to increasing demand. Insurance is a complex product. When farmers do not understand the product being sold, they are less likely to be willing to pay for it. If basis risk is not understood, individuals may buy more insurance than they should at first and may reduce insurance purchases over time.

Linkage with banks and other organizations. Banks and insurance companies cooperate with and depend on each other. A linkage and close working arrangement with the banking sector is significant for crop insurance. Marketing of insurance is much easier if it is linked to credit. Insurance tied to credit access and/ or technology adoption provides farmers with a good income proposition and makes the purchase of insurance attractive. Other institutions with which linkages would be fruitful are cooperatives, suppliers of inputs such as fertilizer, pesticides seeds and farm equipment, marketing organizations, extension services of the Government, research institutions and universities concerned with agriculture.
REFERENCES


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APPENDICES

APPENDIX 1: Questionnaire

Questionnaire serial number………

THE UNIVERSITY OF ZAMBIA
DEPARTMENT OF AGRICULTURE ECONOMICS AND EXTENSION EDUCATION
SURVEY INSTRUMENT
ANALYSIS OF THE FACTORS THAT AFFECT THE ADOPTION OF CROP INSURANCE BY FARMERS
CASE STUDY: CHOONGWE AND MAKENI AREA

This questionnaire is for academic purpose only. Be assured that all the information you provide will be treated as confidential. Please feel free to answer all the questions honestly. Your cooperation will be highly appreciated.

Instructions: Please write the answers in the tables, boxes and blank spaces provided.

PERSONAL INFORMATION

1. Gender
   1. Male [ ]
   2. Female [ ]

2. Age at last birthday: ………..

3. Location (Farming area): ………………………

4. Level of education.
   1. Primary [ ]
   2. Secondary [ ]
   3. Tertiary [ ]
   4. None [ ]
5. Marital status
   1. Married [ ]
   2. Single [ ]
   3. Divorced [ ]

6. Household size? ...........

7. Religion?
   1. Christian [ ]
   2. Muslim [ ]
   3. Hindu [ ]
   4. Others specify ........................................

8. If your answer to question 8 is 1., which church do you belong to? ......................

SOCIO-ECONOMIC FACTORS

9. What kind of farming are you involved in?
   1. Small scale [ ]
   2. Large scale [ ]

10. What is your monthly income?
    1. Below K500,000 [ ]
    2. Between K500,000 and K1,000,000 [ ]
    3. Between K1,000,000 and K5,000,000 [ ]
    4. Above K5,000,000 [ ]

11. What is the size of your farming area in hectares? .........................

12. Do you own this land?
    1. Yes [ ]
    2. No [ ]

13. Do you have other productions at your farm apart from crop production?
    1. Yes [ ]
    2. No [ ]
14. Do you have any other sources of income apart from your farm income?
   1. Yes [ ]
   2. No [ ]

15. What is the main type of crop produced at your farm?
   1. Monocotyledons (Wheat, Barley, Oats, Millet, Sorghum, Maize, Rice) [ ]
   2. Dicotyledons (Pea, Bean, Lentil, Mustard, Sunflower, Linseed) [ ]

16. For how long have you been in the farming business? .......................

17. Have you obtained any credit from a financial institution?
   1. Yes [ ]
   2. No [ ]

18. If yes, was crop insurance one of the requirements in order to obtain credit?
   1. Yes [ ]
   2. No [ ]

CHALLENGES FACED BY FARMERS

19. Do you know about Crop insurance?
   1. Yes [ ]
   2. No [ ]

20. If yes, how did you know about it?
   1. Family and friends [ ]
   2. Extension officers [ ]
   3. Media [ ]
   4. Agents from insurance companies [ ]

21. Do you know what the premium rates are?
   1. Yes [ ]
   2. No [ ]

22. If yes, do you think the premium rates are too high?
   1. Yes [ ]
   2. No [ ]
23. Do you think there is too much paperwork involved in trying to adopt crop insurance?
   1. Yes [ ]
   2. No [ ]

24. Do you know of someone who had bought crop insurance but after suffering a loss was not paid off by the insurance company for one reason or another?
   1. Yes [ ]
   2. No [ ]

25. Do you have any fears that the insurance company will not pay you off after you have suffered losses despite having bought insurance?
   1. Yes [ ]
   2. No [ ]

26. How often do insurance extension service field agents visit your farm area?
   1. Never [ ]
   2. Once in a while [ ]
   3. Regularly [ ]

27. Do you think you have access to adequate information about crop insurance?
   1. Yes [ ]
   2. No [ ]

28. What is the distance of the nearest crop insurance company from the farm?
   1. Within 50Km from the farm [ ]
   2. Between 50Km and 100Km from the farm [ ]
   3. Between 100Km and 150Km from the farm [ ]
   4. More than 150Km from the farm [ ]

29. Have you insured your crops?
   1. Yes [ ]
   2. No [ ]