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**Perception of Microinsurance as a Risk Management tool for Small
holder Farmers in Limuru, Kenya**

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DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the Research Project contains no material previously published or written by another person except where due reference is made in the Research Project itself.

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This Research Proposal has been submitted for examination with my approval as the Supervisor.

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ABSTRACT

The aim of this study was to determine the perception of small holder farmers in Limuru towards microinsurance as a risk management tool for the risks they face. The purpose is to identify the gap that exists between what is offered in the market and what the small holder farmers actually want. The scope of this study was limited to the Limuru region in Kenya through questionnaires distributed to collect the data. The questionnaire consisted of questions that determine the risks the small holder farmers face, the strategies they use to manage the risks they currently face and if they have any insurance covers for their crops. It was discovered that the small holder farmers in Limuru face many risks but have not purchased any form of crop insurance to mitigate their risks which led to the conclusion that the small holder farmers in Limuru do not perceive microinsurance as a risk management tool. Small holder farmers can benefit from microinsurance in comparison to the risk management strategies currently used, which have drawbacks in the long-term. The government, reinsurance companies and insurance companies can offer microinsurance products at a cheaper rate to farmers which will prevent them from incurring the losses they face due to adverse events.

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CHAPTER 1: INTRODUCTION

1.1 Introduction

Smallholder farmers have for a long time suffered losses due to adverse weather conditions and fluctuating prices. Hence, there is sufficient need for microinsurance to protect the farmers from these production shocks which have an impact on the economic development of Kenya. Lack of efficient risk mitigation strategies have led to them being trapped in the poverty cycle of low investments and low returns. This problem can be addressed by insurance companies by developing more products to suit the different crops, this would also increase the opportunities for expansion.

1.2 Background Information

In Africa, the agriculture sector contributes about 30%-40% of GDP and close to 60% of the total export earnings which makes this sector vital in terms of the social and economic significance (“The Actuary Magazine,” 2015). This sector accounts for a substantial percentage of the GDP as well as the major contributor towards Kenyan exports. Moreover, it provides formal employment to the general public of Kenya and the growth of Kenya is highly correlated to growth and development in agriculture. During the period of 2007-2008 the agriculture sector was highly affected by an increase in input prices(fertilizers), adverse weather conditions(drought) and disruption from post-election violence, which led to a fall in the real value added to the economy by 5.4% (Oparanya, 2009).

In 2014, a paper released by the Insurance Regulatory of Kenya stated that major risks facing farmers such as: droughts, excessive rainfall, pests and diseases, volatile temperature and droughts have led to crop failure. Due to the vulnerability of the agriculture sector, there is a need for competent risk management tools that would cater for these risks and reduce the losses farmers would face, one of the risk management tools being microinsurance. The microinsurance market in Kenya is still under developed, although insurers are increasingly

becoming active and expanding into the formal insurance system (The Kenya microinsurance policy paper, 2014).

In Kenya, UAP insurance, CIC insurance and APA insurance offer both multi-peril crop insurance (indemnity based) and index based products. Jubilee insurance and ICEA Lion offer index based crop insurance. Heritage insurance offers the multi-peril crop insurance only (indemnity based) (Chepkoech, 2015).

The sum insured for any crop is based on the inputs (production costs), outputs (harvested value), on the size of the land or an index. The product could also be covered against identified weather perils that can be measured using a computerized weather station. The claim settlement occurs if the yield falls below the guaranteed level as a result of the perils insured. The claims payments are made at the end of the crop season unless a loss during the period.

1.3 Problem Statement

In Kenya microinsurance is sold as a risk management tool for farmers but is it seen as a risk management tool by the small holder farmers? In an ideal situation, there should exist sufficient microinsurance to enable farmers to mitigate risks they face on a regular basis. But in reality microinsurance in Kenya is underdeveloped. A study by FinAccess conducted in 2009 revealed that the rate of insurance penetration is below 3% of GDP, with only 7% of the Kenyan population having any form of insurance (The Kenya microinsurance policy paper, 2014).

Mechler, Linnerooth-Bayer, & Peppiatt (2006) found that most of the insured are drawn from the formal sector, which accounts for about 5% of the total population, and therefore, the informal sector is not adequately provided by insurance. The poor rely on savings, depleting or mortgaging their land and assets, or emergency loans from microcredit institutions or money lenders. This paper will identify the existing gap between what is offered in the market and what products farmers want to mitigate the risks they face. The insurance products are available in the Kenyan market but not every farmer has insured the crops despite there being many risks in farming.

1.4 Objectives

The objective of this paper is to analyze whether crop microinsurance is a suitable risk management tool for Kenyan farmers considering the various risks faced by the small holder farmers.

1.5 Research Questions

The research questions for this study include:

1. What risks do the small holder farmers in Limuru believe they are exposed to?
2. Is microinsurance perceived as an efficient tool for managing risks faced by small holder farmers in Limuru?
3. What other strategies do they currently use to manage those risks?

1.6 Research Hypothesis

The following is the preliminary research hypothesis:

H_0 : The products offered in the market are perceived as a risk management tool by small holder farmers.

H_1 : The products offered in the market are not perceived as a risk management tool by the small holder farmers.

1.7 Scope and Justification of the study

The purpose of this research is to evaluate the microinsurance penetration in Limuru and the views of smallholder farmers on it. It seeks to understand “if microinsurance is an efficient tool why would all smallholder farmers in Limuru not have it?” The proposed research shall cover the risks that affect the smallholder farmers in Limuru and how they currently mitigate those risks. It shall take into consideration whether microinsurance is an efficient tool to mitigate risks and restore the farmers to the same state before the occurrence of the adverse effect.

The research used questionnaires to get the perception of the smallholder farmers followed by recommendations to insurance companies and for further research in this topic. The findings of this research shall be of importance to both the insurance companies and the farmers.

The insurance companies can take in to consideration the main risks that farmers wish to be covered when designing the products in practice and not only theoretically. For the farmers, it will enable them to identify the products offered in the market and if they adequately cater for the adverse events.

This paper is limited only to smallholder farmers in Limuru and not to any other regions due to excessive costs and lack of time. The access to farmers in Limuru was easier and more convenient in comparison to other regions.

CHAPTER 2: LITERATURE REVIEW

2.1 Preliminary

This chapter reviews what developing countries have done to mitigate risks in farming. This is to establish a background for the research on perception of microinsurance as a risk management tool for smallholder farmers. Furthermore, it will build on the problems faced by insurers and smallholder farmers to build a case on the viability of microinsurance as a risk management tool.

Churchill & Matul (2012) defined microinsurance as “Microinsurance is the protection of low-income people against specific perils in exchange for regular premium payments proportionate to the likelihood and cost of the risk involved. This definition is essentially the same as one might use for regular insurance except for the clearly prescribed target market: low-income people” (p. 22). In relation to this paper the microinsurance would be crop insurance and the target market will be the smallholder farmers.

2.2 Risk faced by small holder farmers

The risks that farmers face are likely to affect the productivity of their crop yields. Some of the risks are: heavy rainfall or no rainfall, extreme temperatures, strong wind as well as hailstorms. Moreover, farmers are likely to face market-related risks which comprise of changes in prices of input and output due to change in demand and supply, changes in demand of quality of the product, delay in delivery of products and changes in food safety requirements. Natural disasters such as droughts, floods, hailstorms, cyclones and earthquakes also affect the stability of production levels or harvest. In addition, environmental risks such as pests and diseases affect farmers such as pest and diseases (Jaffee, Siegel, & Andrews, 2010).

Jaffee, Siegel, & Andrews (2010) classified the above risks into two groups: Idiosyncratic risks and Covariate risks. Idiosyncratic risks usually affect an individual farm, these include: pest

and diseases, illness of an owner and quality of the crops from the farmer, whereas, the covariate risks affect many farms at the same time. These include: droughts, floods, fluctuating market prices. Hence, these risks should be considered when designing microinsurance products in order for the insurer to avoid any ruin situation.

In Kenya, farmers are affected by both idiosyncratic risks e.g. fire affecting individual farms and covariate risks e.g. drought affecting all the farmers at the same time. Kenya is hit by one flooding event per year, one epidemic per year and droughts occur on average every four years. The rainfall patterns are volatile with some years of excess rainfall and some years with no rainfall (Kerer, 2013).

2.3 Types of crop insurance available for small holder farmers

Crop insurance covers against loss of crop yield due to the natural disasters such as hail, drought, and floods, or loss of revenue due to declines in the price of agricultural products. The types of crop insurance could be either weather index insurance triggered by a rainfall index, individual yields triggered by observed yield shocks on the farm or area-based yield triggered by a reduction in the average yield in a given location (Jesús Antón, 2012).

Traditionally the individual-yield crop insurance was offered, where the insured receives a payment when the farm incurs a yield loss. To make the payments the insurer would have to estimate the yield loss for each farm (Jesús Antón, 2012).

The index-based insurance is of two types: Weather index insurance and Area index insurance. McCord (2008) stated that index-based insurance protects insured facing risk against extreme weather events, the insured is paid when the outcome is poorer than the expected yield associated with climate conditions. There are two types of indices used: meteorological triggers (weather index) and area yield triggers.

Cole, Bastian, Vyas, Wendel, & Stein (2012) conducted a review of the effectiveness of crop insurance specifically index- based insurance. Area yield insurance provides coverage based on the crop yield in a particular area as the index. If the yield falls below the trigger, the

insurance company pays out the difference. McCord (2008) stated that area yield index overcomes the difficult challenges of moral hazard, adverse selection, the cost of loss adjustment and reduces the possibilities of fraud affecting insurance providers.

On the other hand, it introduces basis risk which is the mismatch between the amount received because the index has been triggered and the amount actually lost by the client which makes it difficult to sell. (McCord, 2008). Unlike the traditional insurance products these ones do not require an inspection to assess the losses since the new parametric insurance covers don't require regular inspection and visits but instead experiments in a small sample size. (Müller, Ramm, & Steinmann, 2014)

For the case of weather index insurance, the insurance covers rainfall, drought, windstorm and hailstorm perils. The weather patterns are recorded at a nearby weather station and if the levels of rainfall, drought, windstorm or hailstorm meet a specific criteria claim payments will be made out. Weather index insurance reduces moral hazard which occurs when farmers deliberately cause the adverse events for the purpose of receiving claim benefits.

Smith & Watts (2008) stated that there is multiple peril crop insurance and Single peril crop insurance. Multiple peril protects the farmers against yield or revenue losses from multiple sources of risk. The single peril risk is protection against well-defined single perils such as fire or hail that can cause damage to the farm and the crops.

Multi peril crop insurance are suitable to perils whose individual contributions are difficult to measure. Mutli peril crop insurance is a costly process compared single peril risk which is also known as Named-peril crop insurance. This is because the insurer has to first establish a yield history of the farmer and then measure the yield at harvest (McCord, 2008).

2.4 Impact of adverse events in farming on the economy

Farmers are prone to various risks everyday especially production risk and adverse weather conditions given that the weather is quite unreliable. When farmers face these adverse weather conditions, it results to partial loss of crop yields or complete crop failure and hence reduces farmer incomes. This further leads to fewer investments in the following season which is a continuous cycle. The correlation among the various risks tend to be high which means majority of the region is affected at the same time.

Fuchs & Wolff (2011) stated that “In developing countries a higher percentage of the GDP is generated by agricultural income and unfavorable conditions can severely affect the overall well-being of an entire region.” In addition to the statement above the uncertain event tends to affect the less well-off which comprise of a higher percentage of the population in undeveloped countries hence it affects majority of the nation in comparison to developed countries.

Kenya is one of the largest tea producer and exporter. “In January 2012, over 20 million kg of tea was lost due to frost, even “small” hail storms or water shortages can cause a significant impact on earnings” (Forichi, 2013). This shows that such uncertain events can cause great damage to the economy and therefore risk management strategies should be adopted to ensure safety of farmers and all the economy.

Kenya has experienced more frequent and severe droughts. The effect of adverse weather patterns has led to a fall in investments in the agricultural sector. This further leads to a fall in production, worsening food security situations and a fall in recovery from the adverse events by the farmers. Furthermore, weather related risks result in disruption of the agricultural value chain, asset destruction, yield reduction and increased market prices (Kerer, 2013).

2.5 Challenges faced by microinsurance providers

Agriculture insurance presents a number of challenges to the insurer due to complexities such as: It is uncontrollable, the occurrence of the event is under the direct control of the insured, unambiguous since it is difficult to assess the degree of the loss that has occurred, fraud in terms of the farmer intentionally incurring a loss so that a claim could be made, adverse selection since the insurer doesn't know information that the insured knows making it difficult to insure, covariant risk where all the farmers in the area are affected and hence claims for insurance will be high and making profits is difficult for the insurer (McCord, 2008).

The main challenge arises when insurers have to charge low premiums when risks are high considering other costs such as adverse selection, moral hazard and the transaction costs of investigating claims which need to be incorporated when charging the premium (Sherman, 2010). Adverse selection refers to selection of higher-risk farmers who are inclined to seek insurance and moral hazard is the tendency to take on greater risk once insured ("The Actuary Magazine," 2015).

Furthermore, there is miscommunication between the provider and the recipient on what is covered by the policy. This could lead to decreased levels of trust on insurance providers making it difficult to sell the products and reducing the effectiveness of microinsurance (Sherman, 2010). Clear communication between the insurer and the recipient is vital as it reduces the chances of the clients lapsing their policies which encourages protection for the long-term.

In Kenya, the severe risks faced by microinsurance providers are: low penetration, rigid regulatory framework, high correlation of risks, mismatch between affordability and sustainability, lack of technical expertise, inappropriate tools for data collection for index-based insurance and lack of capacity to predict climate hazards and these risks could be managed using price adjustments, flexibility in terms of premium payments, niche marketing and public awareness (Arunga, 2012).

In addition, majority of small holder farmers cultivate less than two hectares of land this results to difficulty for indemnity-based insurance contracts because of high administration and

underwriting costs, which makes the costs high relative to the benefits insured (“The Actuary Magazine,” 2015).

2.6 Factors to consider when offering microinsurance

Before the microinsurance is offered to the farmers, there are several factors to be considered to ensure insurance offered to them is a success. According to a study done in Iran for rice farming factors such as the level of education, the age of farmers, farm size, contacts to agriculture experts and rate of annual income from rice cultivation (Nahvi, Kohansal, Ghorbani, & Shahnoushi, 2014).

Nahvi, Kohansal, Ghorbani, & Shahnoushi (2014) also mentioned that it is necessary to create awareness about insurance and increase the tendency to accept insurance for crops. This would maintain the farmers’ yearly income and enable them to pay their premiums due to the measures taken to reduce losses.

When designing microinsurance products understanding the client needs is key. The insurance provider should consider the risks facing the people, the impact of the risks, existing mechanisms used to cope with the risks, the effectiveness of the mechanisms and the role microinsurance can play (Cohen & Sebstad, 2006). These factors influence for the microinsurance products the insurer will provide.

2.6 Other risk management tools used to manage risks

Sherman, 2010 found that in developing countries, the poor cope with losses mainly through informal family and community-based relationships rather than established organizations and firms. These informal mechanisms were inferior to established organizations which would stress families financially and psychologically.

The coping methods would be either ex-post or ex-ante. Ex-post strategies take place after an event has taken place, while ex-ante strategies take place before the events take place.

Most of the strategies used by the poor tend to be ex-post which are less beneficial compared to ex-ante strategies. The ex-post strategies include emergency loans, either from financial institutions or relatives and close friends. These have many problems related to it such as paying high interest rates payments within the short time (Sherman, 2010).

In addition to the above, other ex-post strategies are selling of assets, seeking temporary employment, migration, government forgiving debts and aids to the laborers. Some of these short term risk coping mechanisms have long term impact in terms of increased debts (Jaffee, Siegel, & Andrews, 2010).

Sherman (2010) found that in comparison to the above microinsurance is an example of ex-ante mechanism, which provides more benefits to them. Firstly, microinsurance is targeted towards the poor households which stabilizes their income in adverse situations by paying low premium levels, this is because they no longer have to use a large proportion of their income towards the adverse situation by setting aside less money for a “safety net” in microinsurance.

The ex-ante risk management strategies include: risk reduction (actions to reduce the risky occurrence), risk avoidance (actions to side-step the risk completely e.g. not growing risky crops), risk transfer (transferring risks to a third party e.g. insurance or precautionary savings), risk retention (budgeting against the potential losses), risk mitigation (measures to reduce the negative effects of the risk) (Jaffee, Siegel, & Andrews, 2010).

Traditional coping mechanisms used to mitigate risks were crop diversification where different crops with low correlation to uncertain events are planted, irrigation systems are set up to reduce the dependence on rainfall, investments in other areas which are not related to farming and eradication of pests and savings (Fuchs & Wolff, 2011).

The government employs ex-ante and ex-post strategies as risk management strategies to help the farmers. The ex-ante strategies include: provision of subsidized certified seeds and other farm inputs like fertilizers, extension officers advice farmers on the varieties of plants and harvesting times based on weather forecasts and transferring weather risks to insurance and

capital markets. The ex-post strategies include setting up catastrophe funds which are set aside to assist in uncertain events, donors providing assistance (Kerer, 2013).

In Kenya, the impact of adverse weather has forced farmers to take out additional loans and sell productive assets to pay for food which leads to little capital to invest in their future production (Kerer, 2013).

2.7 The crop insurance products in Kenya

Agriculture insurance has costly premiums which make it difficult to target the smallholder farmers hence the supply chain would consist of big insurance firms, the government and reinsurers to cater for catastrophic risks.

In 2006, Swiss Re in collaboration with local insurance providers in Kenya developed a traditional indemnity- based, multi-peril crop insurance product targeting the medium and large scale commercial farming segments. The aggregators were the Banks, micro-financers, cooperatives and commodity associates.

There are two main types of microinsurance models: partner-agent model and full service model. The full service model describes a situation where the provider of the insurance policy is responsible for all the aspects of distribution of services, payments and claim assessments. The partner-agent model involves cooperation of an insurance provider, such as a bank as well as a microfinance institution (Sherman, 2010).

In 2009, Syngenta Foundation for Sustainable Agriculture (SFSA) in partnership with UAP insurance and Safaricom launched a first index-based weather insurance product called “Kilimo Salama”. This product provided cover against weather risks for smallholder farmers in Laikipia district. Majority of the farmers insured their farm inputs against drought in the long rains of 2009 (Kerer, 2013).

APA insurance started offering index based weather insurance in 2010. The product targeted small holder maize farmers in Embu district. Equity bank acted as the distribution channel of

the product and the risk carrier was APA insurance and reinsurance was provided by Swiss Re (Kerer, 2013).

In 2011, Jubilee Insurance Company also offered index based weather insurance, where small holder farmers in Kenya could protect themselves against weather condition mainly in arid and semi-arid regions of Kenya against sorghum (Kerer, 2013).

In Kenya, the insurance company has an agreement with the farmer on the expected crop yield per acre for the crop being insured. If the farmer gets less than the average crop yield, the insurance company pays the difference to the farmer. This would protect the farmer from a situation where he/she doesn't get any amount at all in case of crop failure. The farmer is insured against specific risks e.g. drought, floods, disease and fire. Furthermore, the farmer can use the insurance protection as a way to enhance loan payments as the farmer is assured of repaying credit using the amount paid from the insurer (Anja Smith, 2010).

2.8 Benefits of crop insurance to farmers

Insurance prevent farmers from suffering massive losses that occur due to adverse events. It prevents them from selling productive assets or using their savings. It also improves their capacity to take risks such as new crops, extended surface cultivation or increased use of pesticides and fertilizers (Müller, Ramm, & Steinmann, 2014).

Taking insurance should reduce variability of income, lower shocks, more income for future investment leading to higher long-term income. The small holder farmers can invest in health and education which benefits them in the long-term (Cole, et al. 2012).

Sherman, 2010 found that microinsurance can provide the means to increase their standards of living since they don't have to allocate a large part of their savings in managing risks. These savings could be invested in the farms or in non-farming activities which can generate income. In addition, it minimizes the need for emergency loans which have high interest rates hence, increased costs for the farmers.

Crop microinsurance promotes peace of mind and individual empowerment, it alleviates fear and stress by increasing farmers' sense of security about the future. Furthermore, it prevents them from reducing consumption e.g. eating less, not educating their children (Churchill & Matul, 2012).

Crop credit insurance reduces the risk of small holder farmers becoming defaulters of credit. The farmers don't have to seek for loans from private money lenders and pay interest for the borrowings (Raju & Chand, 2008).

Agriculture insurance can improve the productivity of agriculture, through helping producers invest in more productive, but potentially riskier, agriculture activities ("The Actuary Magazine," 2015). Higher risks leads to higher returns which means a higher income/profits for the farmers.

CHAPTER 3: METHODOLOGY

3.1 Introduction

This section will comprise of the techniques that will be applied in this study. The research design, the target population, sampling method, data collection method, research procedures and data analysis method.

3.2 Research design

A research design is the plan and structure of investigation so conceived as to obtain answers to research questions (Cooper & Schindler, 2013).

This study will comprise of a descriptive research design. The study will be qualitative and quantitative in nature which will represent the results obtained.

The variables in this study will be a list of risks faced by the farmers, the other mechanisms used to cope with risks, perception on crop insurance.

3.3 Target population

The sample will consist of small holder farmers in Limuru which is located on the eastern edge of the Great Rift Valley, where the major crop grown is Tea which is exported in other countries. However, vegetables such as cassava, maize, potatoes, tomatoes, beans, spinach etc.

3.4 Sample and sampling procedure

The sample population will comprise of 50 small holder farmers in Limuru. The sample was selected due to time constraints, to reduce the costs that can be incurred when travelling to other areas and availability of data. In addition, Limuru is one of the major tea producers in Kenya which is a high export product.

The sampling technique used in this study will be non-probability sampling. Non-probability sampling is based on the assumption that the sample is not chosen at random and not all the individuals have the chance of being selected. Convenience sampling is a type of non-probability sampling, which involves selecting the cases that are easiest to obtain (Saunders, Lewis, & Thornhill, 2009). This study will use both convenience sampling and non-probability sampling.

3.5 Data collection procedure

The study will rely on primary data in form of questionnaires sent to farmers to determine their perceptions on microinsurance. This will generate firsthand information which is more reliable and valid. The aim of the questionnaire is to obtain information on their view towards agriculture insurance.

The questionnaires will revolve around the risks faced by the farmers, how they cater for losses they suffer, whether they have insurance, how they mitigate the risks they face. The questionnaire will consist of both open ended and closed ended questions.

3.5.1 Open ended questions

The questionnaire will consist of open-ended questions to enable respondents to answer freely. This will lead to sufficient collection of information regarding how they manage their risks, the crops they grow and their perception on insurance.

Some of the open- ended questions are:

- What crops do you grow? This question will enable the respondent to freely mention all the crops they grow and not limit them to restricted responses such as: maize, tea, coffee or specific vegetables.
- How do you currently manage the risks mentioned above? This question will enable the respondent to give their opinions freely and answer in detail their opinions. This will allow rich and explanatory information to be grasped. Though, this data isn't quantifiable in nature.
- What risks are most important to be covered by insurance? This question will allow the respondents to mention the various risks that they feel are risky and can be mitigated by insurance. Though, there is a chance the respondents may give out of context responses.

3.5.2 Closed ended questions

In the questionnaire there will be a few closed ended questionnaires such as:

- What are the production risks you face? With a list of risks e.g. pests, diseases, lack of access to inputs, poor decision making, lack of management, lack of back up plans, political risks, etc. This question will generate closed responses which are easier to analyze and compare and there will be an option of other risks which gives the respondent to state any other risk.
- The question on what are the weather risks the production faces? With options such as: drought, excess rain, wind storm, hail storm and temperature. This question will encourage responses in a similar order which are not very variable.

Generally, closed ended questions are easy to analyze generating responses in the same order though, it might not reflect the respondents' opinions and could lead to erroneous data collection with lack of sufficient information.

3.5.3 Data Measurement technique

The data measurement technique used will be the Likert scale. The Likert scale where each statement is assigned a numerical score ranging from 1 to 5 that will be based on 5 points (Cooper & Schindler, 2013) that is: very risky = 5, risky = 4, neutral = 3, less risky = 2 and not risky = 1. The Likert scale is useful in rating the options picked by the respondent and it is used to measure the attitude of the respondent. The Likert scale is going to be used to determine the perception and views of the farmers on the different risks. E.g. is excess rainfall very risky, less risky, neutral, risky or very risky. The Likert scale is easy and quick to construct and it shows the favourable and unfavourable attitudes of the sample (Cooper & Schindler, 2013).

3.6 Data analysis technique

The data collected will analyze the responses of the farmers both in quantitative and qualitative nature. The closed ended questions are analysed using the likert scale and open ended questions using qualitative data analysis approach. The likert scale has two levels of disagreements, one level of neutral and two levels of agreement. The responses from the closed ended questions using the likert scale are presented in a table in form of percentages for the risks and the scale of riskiness perceived by the small holder farmers.

The descriptive analysis used to analyse the responses of the small holder farmers will take the conventional content analysis approach which is suitable for open-ended questionnaires. This approach involves highlighting the exact words from the data to capture the key concepts of the data collected and not any previous theory like the directed content analysis. The major drawback of the conventional content analysis approach is that the responses depend completely on the data collected which raises the issue of validity and trustworthiness (Shannon, 2005).

CHAPTER 4: RESULTS AND FINDINGS

4.0 Introduction

The results and findings section details the data collected (30 questionnaires) of the research conducted, which will later on be analysed in section 4.1. The data collected follows the intended methodology, with a few shortcomings that will be discussed in section 4.2.

4.1 Analysis and results

The questionnaire tested various aspects involved in assessing the perception of microinsurance such as the level of risk involved in terms of theft, weather and production, the current purchase of insurance covers to mitigate the risks they face and the other strategies they use to manage the risks.

Limuru is a location known for many tea and coffee farmers. However, majority of smallholder farmers tend to grow vegetables. From the results, 20% grow tea and the remaining 80% of smallholder farmers grow vegetables such as maize, maize, beans, cassava, tomatoes, potatoes, spinach, cabbages and carrots.

4.1.1 Agricultural risks

Given the discussion in the Literature review, a variety of risks affecting smallholder farmers generally were discussed, hence this section of the chapter aims at analyzing the risks faced by small holder farmers in Limuru. In addition, it aims to answer the research question 1, *what risks do the small holder farmers in Limuru believe they are exposed to?*

A) Input and output risks

Table 1: Results of production risks

Risks	Not Risky (1)	Less Risky (2)	Neutral (3)	Risky (4)	Very Risky (5)
Pests	7%	23%	0%	47%	23%
Diseases	3%	27%	0%	47%	23%
Lack of Access to inputs	7%	13%	7%	53%	20%
Poor Decision Making	10%	7%	3%	43%	37%
Lack of Back up plans	3%	7%	6%	57%	27%
Lack of management	7%	10%	7%	43%	33%
Uncertain policy changes	7%	23%	20%	30%	20%
Political risks	33%	27%	16%	7%	17%
Fall in Demand for products	10%	0%	0%	27%	63%

Source: Data collected

In terms of production, the most significant risk involved is the fall in demand for the products while the least significant risk involved is political risks. Ninety percent of the farmers believe that fall in demand for the products is most risky or very risky and only 10% believe it is not risky. This could be due to the difficulties they face when selling their outputs to the wholesalers or retailers in the market or fluctuating prices in the market.

Small holder farmers face several production risks, one of them being pests. Twenty three percent of the small holder farmers realize pests and diseases to be very risky, 47% of small holder farmers believe pests and diseases to be risky and the remaining 23% - 27% believe it is less risky. Majority of the small holder farmers consider pest and diseases to be risky this could be due to past experiences that they have faced. Given the discussion in the literature review section, pest and diseases are a form of idiosyncratic risks. That is, different farms are

affected by different levels of pests and diseases, this is the likely reason for majority of the farmers perceiving it as risky.

One of the major concerns in a developing country like Kenya is political risks. However, majority of the small holder farmers have a different attitude towards it. Majority of them believe it is not risky or less risky, that is over 50% of the sample.

The other risk that affect small holder farmers is lack of access to inputs, for example: fertilizers, raw materials, labour, water, land, soil and seeds. Twenty percent of the small holder farmer believe it is very risky, 53% believe it is risky, 7% were neutral and 7% not risky. A large proportion believe it is risky due to the difficulties they face while purchasing the inputs required.

Decision making is a key element in ensuring that the output will be of high quality and quantity. Eighty percent of small holder farmers found poor decision making to be hazard, where 37% found it to be very risky and the other 43% risky. Furthermore, lack of back up plans is also a threat to small holder farmers, over 50% of the sample believe it is risky or very risky. They are likely to face this risk due to lack of knowledge and information on strategies to minimize the risks they face. Most of the farmers lack education on farming activities which limits their decision making skills.

The risk of uncertain policy changes is considered as being risky by farmers but not as much in comparison to other risks. That is 20% of the sample found it to be very risky, 30% risky, 20% were indifferent, 23% less risky and 7% not risky at all.

B) Weather risks

Table 2: Results of weather risks

Risks	Not Risky (1)	Less Risky (2)	Neutral (3)	Risky (4)	Very Risky (5)
Drought	7%	0%	0%	16%	77%
Excess rain	7%	33%	0%	17%	43%
Temperature	10%	13%	20%	37%	20%
Hail	23%	10%	4%	13%	50%
Wind storm	16%	27%	0%	37%	20%

Source: Data collected

Small holder farmers in Limuru consider weather related factors to be important in determining their final output. All of the weather risks mentioned are perceived as risky or very risky by the small holder farmers. That is, over 50% believe hail, wind storm, drought, excess rain and temperature are considered as a threat.

Limuru is a cold area with low temperature and high precipitation levels, 97% of the small holder farmers believe droughts are risky or very risky. Furthermore, 60% of the sample believe excess rainfall is hazardous to their farming activity.

Despite rare occurrence of hail storms, majority of the small holder farmers comprehend it as a risk. Fifty percent of the sample considered it as very risky and 13% as risky. The remaining 37% were indifferent and found it not risky. Moreover, 57% believe wind storms are a likely threat and remaining 43% found it less risky or not risky. Hence, windstorms don't affect the small holder farmers as much as other weather condition.

Weather risks are not likely to be similar for different locations, this should be considered by insurance providers when designing the products. In Limuru, weather risk is crucial hence the products offered should cater for this risk to encourage farmers to buy the product.

C) Risks of theft

Table 3: Results of risks of theft

Risks	Not Risky (1)	Less Risky (2)	Neutral (3)	Risky (4)	Very Risky (5)
Theft of machinery	17%	16%	10%	7%	50%
Theft of Vehicles	13%	23%	0%	11%	53%
Theft of raw materials	13%	30%	0%	40%	17%
Theft of Stock	14%	24%	4%	40%	18%
Theft of farm implements	13%	7%	7%	50%	23%
Theft of tools	13%	30%	3%	54%	0%

Source: Data collected

Small holder farmers believe theft is a major risk that affects their farming activities. Theft of farm implements is believed to be most risky in comparison to theft of other materials. Seventy three percent of farmers considered it to be risky or very risky and a small percentage (27%) were neutral or consider it as less risky or not risky. The other significant risk is theft of vehicles, 64% of the sample believes it's risky or very risky and 36% believes it's less risky or not risky at all.

Risks such as theft of machinery, raw materials, stock and tools are considered as risky as well. Over 50% of the sample perceives it as being risky but not as much as the risk of theft of vehicles and farm implements. Theft is perceived as a major risk in Kenya possibly due to poverty levels being very high.

In reference to the literature review the main risks affecting farmers are market-related risks, pest and diseases or weather risks (Jaffee, Siegel, & Andrews, 2010). Theft risk for farming activities is rare in other countries. However, in Limuru it has proved to be perceived as very risky by majority of the farmers. This could be due to high crime levels in the location and high poverty levels which encourage individuals on stealing.

4.1.2. Description of the responses

A) Perception on risks that should be covered by insurance

The most important risks farmers believe should be covered by insurance include: drought, theft of machinery, pest and diseases, theft of raw materials, crop failure and fall in demand of products. From the responses, 26.7% of the sample believe that theft of machinery is the most important risk that should be covered and 23.3% believe fall in demand for products is the most important to be insured against. The other 16.7% of the sample believe drought is most important and the following 16.7% believe crop failure should be insured. A small percentage believe risks such as pest and diseases (6.7%) and theft of raw materials are important (10%). In conclusion, the small holder do believe that both input and outputs of the farm assets and good should be insured.

B) Perception on future risks likely to affect small holder farmers

The small holder farmers were asked about the risks they are most likely to face in the next 5 years, 66.7% responded that they are not sure of the likely risks they will face in the future. This could be due to uncertainty or lack of information and knowledge regarding likely future changes. Though, 16.7% of the sample believe its change in temperature that is going to affect them the most in the next 5 years and 6.7% believe it is change in weather conditions that will affect their farm outputs most in years to come. The remaining small proportion of the sample believe it is fall in demand for the products, theft of stock, pests and diseases.

C) Risk management strategies used

Jaffee, Siegel, & Andrews (2010) stated that the ex-ante risk management strategies such as risk reduction, risk avoidance, risk transfer, risk retention and risk mitigation are commonly used. However, farmers in Limuru do not use most of those strategies to manage the risks they face. The only strategy they tend to use is risk mitigation whereby they improve on farm security to reduce the negative effects of the risk.

Majority of them improve on farm security to safeguard against theft, 36.7% of the sample employs guards or watchmen to protect their assets and goods.

Some of the small holder farmers believe that prayers is the way they currently manage the risks (6.7% of the sample had that perception). Furthermore, some of the small holder farmers do not do anything to manage the risks they face. Six out of the thirty farmers do not use any strategies to mitigate their risks currently which makes it 20% of the sample.

There are a few small holder farmers who use insurance covers to manage the risks they believe can have adverse effects (16.7% of the sample). Purchasing insurance covers is a form of risk transfer strategy which a very small proportion of the sample use due to slow penetration of insurance in the Kenyan industry. The remaining 10% of the sample believe that planning well for their farming activities can reduce the risks that they face and the losses they are likely to incur.

D) Alternative strategies used to cover for losses incurred

Mechler, Linnerooth-Bayer, & Peppiatt (2006) found that the poor rely on savings, mortgaging their land or assets and obtaining emergency loans. The responses justify the above statement to a certain extent. The major problem facing most of the small holder farmers in Limuru is that they prefer mitigation of strategies after the events have occurred rather than prevention. A large proportion of the sample proportion (40%) use emergency loans to cater for the losses they incurred.

Emergency loans tend to have high interest rates and repayment of the loan might take a long time which makes the situation worse for the small holder farmers. Furthermore, this strategy tends to stress families financially and psychologically (Sherman, 2010).

Though, some farmers are cautious so they tend to invest in non-farming activities that would generate income that can be saved and used when an uncertain event occurs. The other 40% invest in non-farming activities to diversify and spread their risks which will ensure they are not in a worse place in case an unwanted event takes place.

Some small holder farmers, that is, 23.3% of the sample diversify the crops they grow. They grow different crops and not concentrate on a single crop, this can minimize the risks they face.

Example: if the demand of a certain crop falls, the farmer can recover that loss by selling the other crops he/she has grown which is not affected by the fall in prices.

The farmers should be educated on the importance and benefits of different insurance schemes to enable them to make efficient decisions which are cost effective. Purchasing crop insurance covers would prevent them from suffering in the long term.

To find out if microinsurance is considered as an efficient risk management tool, a few questions were asked and the findings were as follows:

E) Perception on insurance covers

A small percentage of the small holder farmer sample have any form of insurance cover. That is, only 17% (5/30) respondents had any form of insurance. Three of the farmers have purchased motor insurance covers which is requirement by law in Kenya and to cater for any damages caused to the motor vehicle. The other 2 small holder farmers have insurance against their machinery, vehicles and farm output policies. The above statistics justify that a very small proportion of small holder farmers purchase any form of crop insurance.

The remaining 83% have no insurance covers to mitigate the risks they believe they are likely to face. Out of the 83%, 30% of the sample believe they have little or no information and knowledge concerning the insurance policies available in the market and how useful it could be to them. The other 30% of the sample do not have enough funds to pay for premiums and purchase an insurance cover. The aim of microinsurance is to target the less well-off in the society and lack of funds shows that there is demand that exists for it. Microinsurance is usually sold at a cheaper price and likely to incur losses for the insurer, therefore, it can be provided with the help of the government and non-profit making organizations.

A small percentage thought that the premium was large, the compensation time span was long and it was a time consuming process to receive the claims payment. This means that 10% of the population could have had insurance covers initially and later on after the complications they faced, the small holder farmers withdrew their policies. Insurance companies should improve on the services they offer to the farmers to ensure that lapse rates are minimal.

A very small percentage (3%) of the sample believes that the risks they face are not insurable. The possible reasons for such a perception could be lack of information concerning what is available in the market. Moreover, a substantial percentage (27%) had no reasons and did not answer this particular question, this implies that the small holder farmers have little information regarding the insurance covers in the market.

New insurance products such as: the crop-revenue insurance product combines the production and price risk this is because these two elements are vital in determining the gross revenue, the product is designed to meet any shortfall in revenue from crop sales. It tends to be different from the traditional insurance products where the insurable interest is an income stream rather than as the intrinsic value of the biological item at risk (Roberts, 2005).

4.2 Limitation of the study

There were several limitations related to this study. To begin with, the chosen sample was limited to the small holder farmers in Limuru only. Therefore, an expanded sample based on a wider range could help reflect the perceptions of the farmers better.

The limited period over which the analysis was based had limited the amount of data available for a plausible study to be conducted. This is because of the time it takes for the questionnaires to be sent to Limuru, filled and sent back. In addition, the study was restricted to small holder farmers and not large scale farmers which limited the sample of this research.

On the other hand, the main obstacle was language barrier where the small holder farmers could not understand technical English or Kiswahili regarding the questions asked which restricted the descriptive responses received. Moreover, the financial resources were finite this led to a limitation of the research sample.

CHAPTER 5: DISCUSSION, CONCLUSIONS & RECOMMENDATIONS

5.1. Introduction

This study was conducted to find out the perception of the small holder farmers on various risks they face, the strategies they currently use to manage those risks and if microinsurance is an efficient risk management tool. From research, the main risks affecting farmers are market risks, weather risks and production risks. The strategies mostly used to manage those risks include emergency loans and crop diversification which have consequences in the long-term. This led to the research objective of finding out whether crop microinsurance is an efficient tool for managing the risks smallholder farmers face in Limuru.

The study used data collected from the farmers using questionnaires. This was to get firsthand information and find out their perceptions and considerations regarding the risks they face and the strategies they use.

This chapter will include the discussions regarding the study, the conclusions made after analyzing data in the previous chapter and the possible recommendations for further study regarding this topic.

5.2. Discussions

The main research questions of this paper was the main risks affecting small holder farmers in Limuru, the results showed that majority of the risks discussed in the literature review affect the small holder farmers adversely. Jaffee, Siegel, & Andrews (2010) discussed the main risks affecting farmers which include: pest and diseases, weather risks and market related risks. The main production risks affecting the small holder farmers in Limuru are: fall in demand for products, lack of management, lack of back up plans, pests and diseases.

The weather risks perceived to be risky include, drought and temperature. Limuru is a cold area we expect the farmers to be affected by excess rainfall but farmers perceive drought to be of high-risk. Fuchs & Wolff (2011) mentioned the use of irrigation systems which reduce the dependence on rainfall to mitigate risks beforehand.

In addition they are affected by theft of farm implements and theft of stock which would lead to delays in the farming activities.

The above risks should be considered when designing products for Limuru small holder farmers as it will mitigate their risks and it will also be a successful product for the insurer.

The farmers believe that in the next 5 years the risks they are likely to face include; change in temperature, weather conditions, pest and diseases and fall in demand for products. These risks could be transferred to the insurer through the purchase of insurance and prevents the small holder farmers from suffering massive losses and selling of assets to cater for the losses (Müller, Ramm, & Steinmann, 2014).

The small holder farmers can manage the future risks by purchasing the multi peril insurance products compared to single peril insurance products. Multi peril insurance products cover for many perils and are mostly indemnity based (Smith & Watts, 2008). In Kenya, multi peril insurance products are offered by UAP, APA and CIC insurance companies (Chepkoech, 2015). However, the premium rates shall not be as low as expected this is because the above companies do not offer microinsurance which aims at offering lower premium rates.

A substantial proportion of the sample (23.3%) used ex-ante strategies to manage the risks they face, the small holder farmers diversify their risks by using the crop diversification strategy. The responses received showed e.g. one small holder farmer grows maize, beans and potatoes, that is they do not just grow one crop but 3 different crops to reduce the weather risks and fall in price of products risk. Crop diversification involves growing multiple crops with different vulnerabilities to weather events (Fuchs & Wolff, 2011), it is effective as it also protects farmers from the risks of fall in prices for some products, having grown a variety of products if the price of one crop falls it could be recovered by the crop where prices are rising or have not fallen. However, it prevents the farmer from taking high risks which could lead to high returns.

Majority of the farmers stated that they invest in non-farming activities, non-farming activities include: income derived from non-farming activities, self-employment in commerce, or manufacturing (Reardon, n.d.). E.g. some small holder farmers are working as teachers and are part-time farmers. Such strategies generate regular income for the small holder farmers

preventing them from no source of income in case of any uncertain event which leads to large losses.

Based on the responses received majority of the sample had no access to any form of insurance and in the sample of 30 small holder farmers only 2 has purchased any form of crop insurance which is a very low percentage of insurance up take. This could imply that there is a market for crop insurance products if insurance providers educate the small holder farmers on the existence of the products available and the benefits.

The low uptake of crop insurance shows that it is not perceived as an efficient risk management tool by the small holders which supports the null hypothesis that is “The products offered in the market are not perceived as an efficient risk management tool by the small holder farmers”. Although, as discussed in the literature review the microinsurance products in the Kenyan market have been specialized for different locations e.g. Laikipia, Embu, arid and semi-arid regions and not specifically for the Limuru region which supports the reason behind the low uptake of crop insurance products. Small holder farmers could purchase the mutli peril and index based insurance products of offered at affordable rates and in form of flexible installments.

The main reasons given by small holder farmers to justify the low uptake of crop insurance products include; lack of knowledge and lack of funds to purchase insurance covers. This makes crop microinsurance a viable product for the small holder farmers if awareness of the products is created and appropriate premium rates are set (Jaffee, Siegel, & Andrews, 2010).

5.3. Conclusions

To conclude, the study has effectively shown the different risks perceived by the small holder farmers in Limuru and that microinsurance is not perceived as an efficient risk management tool due lack of information regarding this matter leading to the low penetration of microinsurance. All relative stake holders should consider working together to provide cost-effective microinsurance to small holder farmers in Limuru as it is highly needed. Structural reforms need to be put in place to ensure that microinsurance provided is of the right nature,

covers the relevant risks and is affordable relative to the risks insured and benefits acquired by the small holder farmers.

5.4. Recommendations to insurance companies

From findings of this research, insurance companies should create awareness of the product they offer because small holder farmers have minimal information regarding the benefits of the products and their existence.

Microinsurance is the protection of low income people against specific perils. In this study, the focus was on crop microinsurance to be offered to the small holder farmers. Given the discussion in literature review the main challenges facing microinsurance providers in Kenya are low penetration rates, high correlation of risks and mismatch between affordability and sustainability which are justified by the responses obtained from the data collected.

To deal with the above problem, public private partnerships (PPP) can be effective, PPPs have been practiced in the American and Canadian economy (“The Actuary Magazine,” 2015). This strategy could be adopted by other insurance companies as well. The public private partnerships also involves the government, the government can finance, subsidise, impose tariffs, finance infrastructure and control the prices of the products offered (IFC, 2015).

Insurance companies should develop policies taking into account the risk characteristics of the farmers e.g. frequency of payment. Farmers tend to be reluctant to pay their premiums at the start of the season hence innovative ways such as: linking premiums to previous season’s sales, linking to savings deposit and payments in installments e.g. weekly or monthly (Mookerjee, 2015).

Insurance companies should work towards maintaining a positive relationship as this is very key in the case of smallholder farmers. They should pay claims faster and with less complications as possible so that the farmers can place their trust and in the insurance companies and believe that they will actually pay in case of an event.

5.5. Recommendations for further research

This research study undertaken answered the research question posed, that is, whether crop microinsurance is taken as a risk management tool by small holder farmers in Limuru. However, this study was limited to sample of only 30 small holder farmers. This study could be further extended to various locations and a large sample of small holder farmers to grasp the relevance of crop microinsurance.

Insurance companies, government organizations or international organizations could carry out an in depth research concerning especially due to fewer restrictions with finance and time. Research on the perception of microinsurance as an efficient risk management tool could be carried out in different locations of Kenya.

Appendices

Appendix 1: Letter of Introduction

SCHOOL OF FINANCE AND APPLIED ECONOMICS

15th July 2016.

Our Ref.:

Adm. No: 078873

Patel, Bansri Mukseshkumar

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: REQUEST FOR DATA FOR UNDERGRADUATE RESEARCH PROJECT

This is to certify that, Bansri Patel, is a bona-fide student at Strathmore University, pursuing a Bachelor of Business Science in Actuarial Science at the School of Finance and Applied Economics, currently in her final year of study.

Bansri is doing an Applied Research Project titled "*Perception of Microinsurance as a Risk Management tool for Smallholder Farmers in Limuru, Kenya*", which is a requirement by the university. And as such, Bansri would request you to fill her questionnaire.

She and the university commit to follow all the confidentiality regulations required. We shall appreciate any assistance given to her. If you require any further information, please do not hesitate to contact the undersigned.

Kind Regards,



Raphael Karanja.

Faculty Manager.

School of Finance & Applied Economics.

Strathmore University.

E-Mail: rkaranja@strathmore.edu

Appendix 2: Questionnaire

1. What crops do you grow?
2. What are the production risks you face and how risky are they? (tick in the box, ratings are on a scale of 1-5 for the risks where 1- least risky and 5-most risky)

Risks	Not risky	Less risky	Neutral	Risky	Very risky
Pests					
Diseases					
Lack of access to inputs					
Poor decision making					
Lack of back up plans					
Lack of management					
Uncertain policy changes					
Political risks					
Fall in demand for products					
Other					

3. What are the weather risks that production faces and up to how risky are they? (tick in the box, ratings are on a scale of 1-5 for the risks where 1- least risky and 5-most risky)

Risks	Not risky	Less risky	Neutral	Risky	Very Risky
Drought					
Excess rain					
Temperature					
Hail storm					
Wind storm					
Other					

4. What risks of theft do you face? (tick in the box, ratings are on a scale of 1-5 for the risks where 1- least risky and 5-most risky)

Risks	Not Risky	Less risky	Neutral	Risky	Very risky
Theft of machinery					
Theft of Vehicles					
Theft of raw materials					
Theft of Stock					
Theft of farm implements					
Theft of tools					
None of the above					
Other					

5. How do you currently manage the risks mentioned above?
6. Have you taken any insurance for these risks? (tick in the yes or no box)
- Yes
- No
7. If yes, what insurance do you have? How well does it cover your risk?
8. If no, why?
9. Do you suffer big losses as a result of the above? How much on average do you lose?
10. Which risks are most important for you to be covered by insurance?
11. In the next five years which risk do you think you are likely to face most?
12. Any other strategies you use to cater for the losses apart of insurance? (tick the box)
- emergency loans
- selling of assets
- crop diversification
- investing in non-farming sectors
- savings
- Others (Please Specify)

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