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In partial fulfillment of the B.Comm. Honors degree in Risk Management and Insurance

FINAL PROJECT

The relevancy of crop insurance in enhancing food security in Zimbabwe

Dedication

To my mother, I am what I am now because of you. Your presents tattoos a billboard of hope on me

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Acknowledgements

Firstly, I would like to thank the Almighty who guided me throughout my entire life and made sure I always kept my head above water. You are worthy to be praised

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ABSTRACT

Food security is a critical phenomenon amongst developing countries. Most nations are now placing greater emphasis on crop insurance as a means of managing farming risk and enhancing food security. With Southern Africa having been hit by weather hazards such as floods and drought over the past few decades and its agricultural output continuing its downward plunge, the paper explores the relevancy of crop insurance in enhancing food security and facilitating agricultural productivity in Zimbabwe.

The study looks at the benefits of crop insurance, conditions necessary for a sustainable crop insurance program, and emerging perspectives on crop insurance. The research also explores case studies of countries that are using crop insurance, giving a radical analysis of how it has contributed to food security enhancement. There is also further literature on crop insurance in both developed and developing countries

Fifteen farms were surveyed through questionnaires. The target respondents were either farm managers, or owners .Samples for investigation purposes were selected using the probability sampling procedures and descriptive statistical measures were used to analyse the data.

The survey showed that farmers are mostly affected by climatic risks. This therefore was suggested by the paper to be the foundation of a successful crop insurance programme as any crop insurance facility would be measured by its coverage of climatic risks

The study also showed that 30% of the respondents were not willing to take up crop insurance for various reasons. It also revealed that 55% of the farmers had no crop insurance and 10% had no knowledge of crop insurance at all. However, despite the statistics obtained, the survey revealed that most farmers were willing to take up crop insurance given that there is an improvement in terms of its coverage. Most farmers expressed their willingness to participate in the restructuring of a new comprehensive crop insurance facility.

The research concluded that Zimbabwean agriculture industry does not meet the conditions necessary for a sustainable crop insurance program. The research further gave recommendations that may ensure the successful implementation of a comprehensive crop insurance facility. The paper also gave suggestion of a typical crop insurance program that may be used in Zimbabwe.

The paper concluded that crop insurance can enhance food security in Zimbabwe but can not be singled out as the panacea to the food security crises in Zimbabwe. There is need for complementary programmes from the government, the financing institutions, research institutions and meteorological bureaus and there is also need for cooperation amongst the farmers

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Of study

Food security is a pressing issue for most developing countries especially in the Sub Saharan Africa. Zimbabwe experienced falling agricultural output for the past ten years, which adversely affected individual households and the economy at large. With agriculture contributing around thirty percent of the GDP in Sub Saharan Africa, it would be of interest to note that the majority of the population lives in the rural areas, where they solely depend on agriculture. In Zimbabwe, Agriculture has been a major contributor to our country's GDP (estimated at around 15% of GDP per annum). The economy is also agro based. With the majority of the population depending on it, agriculture creates employment, enhances food security, improves standards of living, and promotes GDP growth and a healthy economic well being of the society as a whole.

However, agriculture is exposed to weather related risks. Drought, floods and pests greatly affect the incomes of the rural households thus making them vulnerable to poverty and poverty related diseases. Southern Africa was hit by three major droughts since the 70's, that is, 1974, 1984-85 and 1991-92. The country has since ceased to be the "Food Basket" of Southern Africa, as it was also adversely affected by these droughts. Recently, the *World Food Programme (WFP*) and the *Food and Agricultural Organisation (FAO)* forecasted a grain deficit in Zimbabwe for years 2007 – 2008, with between 600 000 and 800 000 metric tonnes against the national requirements of two

million metric tonnes per year. The falling food production exposed millions of people in the country to starvation, and the government attributed this deficit to drought.

The advent of such weather-related risks has seen research institutes recommending various methods to curb these risks. Most researchers have recommended crop insurance as a solution to these weather related risks *(UNCTAD 1981*). It is to be noted with interest that most of the countries in Africa (Zimbabwe included) are having crop insurance schemes, yet their contribution to food security enhancement has been close to none. Because of such, most governments are placing little emphasis on crop insurance as a solution to the precarious food situation we are facing. In those nations, which are still relying on crop insurance, the covers are just shallow and meaningless to say the least. In light of this, one may thus conclude that crop insurance will not work in developing countries.

Recent developments have seen researchers reemphasizing the importance of agricultural insurance as a solution to the weather related risks affecting agricultural productivity. Empirical evidence has shown renewed optimism in agriculture Insurance. In the United States, agricultural insurance products such as weather derivatives are said to have effectively worked in enhancing food security in the country. The fact that crop insurance has worked in developed countries can provide a great chance that it will also work in the developing nations. This paper will seek to explore the chances of the crop insurance scheme in being successfully implemented. It will also seek to establish the conditions that may have to prevail for such scheme to be successful.

1.2 Research Objectives

The research aims to achieve the following objectives;

1. Establish the relevancy of agricultural insurance in enhancing food security in Zimbabwe.
2. Demonstrate that farmers should invest in agricultural insurance inorder to realize optimum yields in their agricultural output, as well as guaranteed financial return
3. Incorporate recent techniques and developments being used by the global world and come up with the most suitable and comprehensive agricultural insurance scheme, tailor made for the Zimbabwean situation

1.3 Justification of the research

The research will be of great significance, as it will help in the following areas;

- It will provide an understanding of the broader scope of Agricultural Insurance and risk management by the farmers and all the stakeholders involved, which in turn will facilitate increased production
- The Zimbabwean economy is agro based and apparently agricultural output is very low (FAO 2007). The research provides the best methods of managing risks faced by farmers and ensures improved production methods. This in turn boosts foreign currency inflows
- The research will reorient the importance of agricultural insurance; encourage a culture of risk management and extensive research and development on the part of

the farmers. It will also equip farmers with extensive knowledge on the nature of risks they are exposed to and also on best farming methods to reduce such risks

- The research will also support the government's initiative on revamping the agricultural sector as it will provide alternative means of enhancing food security in the country
- The research will prompt the local insurance sector and research bodies on current trends in Agricultural Insurance and provides a foundation for further research
- The research will address the problems faced by Zimbabwean crop farmers and provide possible solutions to the problems to ensure they produce at their maximum capacity with less fears of financial losses hence improved peace of mind

1.4 Scope of Study

The agricultural sector encompasses the following key players, which shall form the researcher's delimitations;

1. The small to large scale commercial farmers and their ministry of Industry and Agriculture
2. The Insurance Companies, including brokers and Reinsurers
3. Regulatory Bodies such as The Reserve Bank Of Zimbabwe
4. The research shall be limited to crop farming and shall not delve much into livestock insurance
5. Because of cost and time restrictions, the research shall be limited to Harare and Bulawayo only

The researcher will focus on these areas to establish a comprehensive and conclusive method of approaching agricultural insurance

1.5 Research Questions

The research shall also be guided by the following questions

- What role can agricultural Insurance play in enhancing food security and reducing weather variability risks and other critical risks faced by farmers
- What have developed countries done to ensure the successful implementation of the agricultural insurance scheme? Can these schemes fit into the Zimbabwean situation?
- What are conditions necessary for the successful implementation of agricultural insurance Programme in Zimbabwe
- What measures have been taken to restore the food situation in Zimbabwe
- What is the likely impact of agricultural insurance on the incomes of farmers
- What is the likely future of Zimbabwe's food situation given a comprehensive agricultural scheme is introduced?

1.6. Limitations of the research

The researcher is likely to face the following challenges in carrying out the research;

1. Limited time horizon to carry out the research.
2. Limited financial resources as a lot of traveling will have to be done in traveling to and from Harare and other parts as most of the players to be surveyed

(agricultural insurance companies, farmers and insurance companies) are based outside Bulawayo

3. Agriculture is very sensitive in developing countries especially in Zimbabwe. This is likely to distort data collection and the researcher might also get biased information as respondents are likely to be biased and censoring information

CHAPTER TWO

LITERATURE REVIEW

2.1 Definition of Food Security

The *Food and Agricultural Organisation (FAO),* defined food security as the availability and access to food by all for a healthy and productive life. They use accessibility and availability of food as a measure of food security. *Maxwell and Frankenberger (1992)* analyzed assumptions in the definition of food security and found four concepts implicit in the notion of secure "secure access to enough food all the time". These were;

- sufficiency of food, defined mainly as the calories needed for an active, healthy life
- access to food, defined by entitlement to produce, purchase or exchange food or receive it as a gift
- time, where food insecurity can be chronic, transitory or cyclical
- security, defined by the balance between vulnerability, risk and insurance

There are instances where food may be available on the market but if people have no access to it due to say lack of sustainable incomes then there is no food security in such a country. Southern Africa has experienced three major droughts since the 70's, i.e. 1974, 1984-85 and 1991-92. Except for South Africa, the food situation in Southern African countries is very alarming, given that the Sub Saharan Africa is the only continent where growth in food production (1.6%) has lagged behind population growth (3.1%). *(FAO, 2000)*

Any development initiatives in Zimbabwe should thus focus more on women because they are a strategic point as far as economic development is concerned (population growth rates).

2.2 Potential Benefits of Food Security

In most developing economies Zimbabwe included the agricultural sector is of critical importance since output of this sector constitutes a large proportion of GDP in these economies. Agriculture is one of the most important sectors of Zimbabwe's economy. It provides over half of the country's total employment and contributes about 15 percent to the Gross Domestic Product. It generates about 40 percent of the country's foreign exchange earnings and provides the bulk of raw materials to the manufacturing sector *(FAO 2002 Special Report)*. Because of its strategic importance, the agricultural sector tends to be the most politically sensitive of all economic sectors in poor countries, that is the reason why negotiation within the world trade organisation the agricultural sector have been the most contentious.

However, this sector is exposed to a high degree of risk arising from unfavorable weather like drought, floods, frost, hail, etc. Pests also cause another risk dimension in this sector for instance the locust invasion seen in West African Countries of Niger, Mauritania & Mali (in 2005).

Risk is an inevitable but manageable element in the business of agricultural production. Agricultural production can vary widely from year to year due to unforeseen weather,

disease/pest infestations, and/or market conditions causing wide swings in yields and commodity prices. These wide swings generate high variability in farmer household income and the uncertainty in future incomes complicates both short-term production and long-term planning. When the swings significantly reduce income in the short-term, there can be serious repercussions in the absence of effective risk management tools, especially when those swings are systemic shocks to the whole sector. The negative shocks, for example, can affect farmer's ability to repay financial obligations and lead to a loan default. Lending institutions may then be less inclined to extend loans to this sector in general due to high probability of loan default. The inability to easily access external financing over times limits farmer's abilities to expand, diversify, and modernize. *(Mark Wenner and Diego Arias, 2000)*

The various risks that the agricultural sector faces include the following;

- *Climatic risks*- Hail, frost, drought, flood, wind, fire, snow, ice
- *Sanitary risks* – Plagues and diseases
- *Geological* – Earthquakes, volcanoes
- *Market* – Domestic and international prices variability and changes in quality standards
- *Manmade* – War, financial crises, collapse of legal institutions
- *Asset risks* – This includes theft, fire and other damage or loss. Losses are generally covered by insurance or in case of calamity; the public disaster aid may help to reduce the losses outcomes.

- *Production or yield risk* - most of the time the weather is responsible, but it also includes risks like plant and animal diseases. Yield risk is measured by yield variability. In turn, yield variability for a given crop differs from region to region, while is determinate by the soil type, the climate and the production method. Regarding livestock sector, the risk is less considerable, because weather has a smaller influence.
- *Price risk* – This is the risk of falling or raising prices after a production modification has been done.
- *Institutional risk* – This risk is associated with policy changes which intervene with agricultural issues and that can have a negative impact on farm revenue.
- *Financial risk* - depends from the possible increase of interest of a mortgage, insufficient liquidity and loss of equity *(Zorilla Jose' Luis,2002)*

The above-mentioned risks can be often interrelated, so one event can create several impacts on other realities. All the categories of risk have an effect on the income of the stakeholder. Risk perception can vary from farmer to farmer, from sector to sector and from product to product, it depends on the farmer's experience and on the degree of risk-aversion. For instance, in 1997 a survey was carried out in the Dutch livestock sector in which it was identified that the price risk was the highest source of risks, followed by institutional or personal risk. On the other hand, a similar survey was carried out in the US on other production programmes as wheat, corn, soybean, etc. In this case, the producers were more concerned about yield and price risk, while livestock farmers worried mainly for institutional risks *(Mewissen, Huirne and Hardaker 1999).*

To curb some or all of the above risks, various risk management measures are employed and these can constitute the following;

- Crop Diversification
- Maintaining financial reserves
- Reliance on farm employment and income generation
- Production contracting
- Marketing contracting
- Forward pricing
- Futures option contracts
- Leasing inputs and custom hiring
- Crop and revenue insurance *(Zorilla, Jouse' Louis, 2002)*

It is however unfortunate to note that many of the more modern risk management tools are not widely available or accessible in developing countries. In order for these risk management techniques to materialize, certain market and supply conditions have to be met and appropriate infrastructure, must be in place. Unfortunately in developing countries, many of these conditions are missing or incomplete, forcing farm operators to depend more on private, on-farm strategies that inhibits the achievement of economies of scale in production, lowers productivity, and ultimately reduces farm profits in the long-run. In contrast, when crop insurance is combined with forward pricing strategies it has been proven to be very effective in reducing both production and price risk for farm operators in developed countries (*Makki, 2002)*. Neither technique, however, is widely

available in developing countries. The unavailability of comprehensive insurance programme can be attributed to the following problems that insurance poses;

- Crop Insurance is a collective system for reducing economic uncertainties due to crop failure. The idea behind insurance is that of risk pooling. Risk pooling involves combining the risks faced by a large number of individuals who contribute through premiums to a common fund, which is used to cover the losses incurred, by any individual in the pool. In order for a risk to be insurable, two basic requirements have to be met: managing the adverse effects of "asymmetric information" and overcoming the implications of "systemic risks". Natural disasters or epizootic diseases cause special problems for insurance. Natural disaster risk within a certain region is a highly correlated risk between the farmers of that region, with a low probability of very high losses. There are several reasons why it is difficult to develop insurance products to cover such risks (*Skees 1997):* If re-insurance or state guarantees are not available, the nature of the systemic nature risks makes it necessary for an insurance company to charge high premiums (which can be unaffordable for many farmers) and to build up substantial capital reserves. Insurers are finding difficulties in managing systemic, non-diversifiable risk in crop yields stemming from say natural disasters affecting a large number of farms over a widespread region. Even with the possibility of reinsurance, it is hard to calculate fair premiums in order to develop sufficient reserves for low probability but high loss events. (*Mark Wenner,1999)*

- The other problem is the presence of asymmetric information, which can lead to adverse selection and moral hazard problems, and raises the cost and risks of introducing crop insurance products. Adverse selection in insurance markets refers to the situation where insurers find it impossible or very expensive to distinguish between high-risk and low-risk insurance applicants and thus prices insurance contracts at the average premium for all individuals, which is inappropriate and non-sustainable. This results in undercharging high-risk customers and overcharging low-risk customers for identical contracts. Over time the low-risk clients drop out of the market and the insurance company is left with a very high-risk pool of clients with higher expected indemnities that negatively affects insurer's profitability. *(Skees,1997*)

Moral hazard refers to the situation where the granting of an insurance contract can lead to a reduction in the application of utmost good faith practices or the complete altering of production practices on the part of the client, resulting in higher loss claims. This brings out a serious problem of scarcity of relevant historical data useful to calculate a premium because of the infrequency of such events.

If governments provide ad-hoc disaster payments, this stifles the development of insurance products. As natural disasters, epidemic diseases have a systemic character and the data concerning outbreaks are normally rare. In the case of animal diseases, farmers can reduce the chance of an outbreak of a disease by taking appropriate precautionary measures (vaccination, veterinary screening of the herd, etc.). Furthermore, state

involvement is important with respect to both legislation and covering direct losses resulting from outbreaks of animal diseases. As governments normally cover direct losses, losses, which need to be covered, are those called consequential or indirect losses, resulting from business interruption (empty buildings), supply and delivery problems (because of movement restrictions) and repopulation (*Meuwissen et al 1999; Meuwissen 2000)*

These two problems affect all insurance markets but more so in agricultural ones because obtaining information on clients is more difficult and monitoring client behaviour is more costly. Because of the geographic dispersion of clients in rural areas and the highly differentiated production characteristics of each farm, the administrative costs of effectively monitoring effort and differentiating between "legitimate" and fraudulent loss claims can be prohibitive. If the "coverage of loss" is set too low, on the other hand, to discourage carelessness and negligence, the market can be become very thin and the advantages gained by pooling risk types, the essence of insurance intermediation, is lost.
As a result of these two incentive problems—adverse selection and moral hazard, agricultural insurance is generally not available, and if it is available, it is not affordable to the majority of farm operators.

2.3 Nature of Insurable Risks in crop Insurance

According to *Skees and Barnett 1999*, risks are insurable, if certain conditions are fulfilled, which conditions include the following;

1. The insurer and the insured have the same information as regards the probability of a bad outcome (Symmetric information). This is normally not the case; the main problems are moral hazard and adverse selection.
2. Risks should be independent across insured individuals. If risks are systemic (dependent), special measures have to be taken in order to make insurance solutions viable.
3. Risks should be calculable: In order to fix the premium rates, the insurance company must be able to calculate the chance of loss, the average frequency and the average severity of loss. Actual losses occurring must be determinable and measurable.
4. Premiums must be affordable. With the little incomes realized by most farmers in developing countries, this condition is usually compromised

Should the above conditions be met, the key question is hence, what role, if any; can insurance play in the enhancement of food security?

2.4 Benefits of Crop Insurance

FAO (Journal 27 of 1994) cites the following as the potential benefits of Crop Insurance;

(i.) It can facilitate increased production

(ii.) A certain level of income is guaranteed to the farmers even if the crop fails

(iii.) Crop Insurance can also act as an incentive for farmers to try new varieties of farming if they know that the risks involved can be transferred.

(iv.) Farmers will be more willing to borrow to Finance production if they know that loss of their crops due to one of the insured perils will not leave them with debts they cannot repay.

(v.) Researches by Insurers can bring about good farming methods to prevent potential claims arising from crop failure.

(vi.) Increased level of income due to increased productivity.

(vii.) Indirect benefits to government such as

(a) Reducing the need for government to rely on ad hoc disaster relief programmes.

(b) Contributing to price stabilization for agricultural produce.

(c) Reducing reliance on food imports by government thereby improving the country's B.O.P position.

(ii) Agricultural Insurance contributes towards rural development.

(iii) Farmers can use crop Insurance as an ideal form of collateral security when they want to buy from financial institutions.

2.5 General Conditions Necessary for a Successful Crop Insurance Programme

Several researches have been able to come up with general conditions that must prevail for a successful crop insurance programme. The following are the general conditions necessary for a successful crop insurance programme;

1. Need for an understanding of Crop Insurance amongst the rural population and their financial capacity must also be ideal
2. There must be a sound statistical base for determining anticipated loss costs (for the law of large numbers to operate) and showing things such as crop yields, variability of these yields from season to season and region to region.

3. Crop Insurance is more likely to succeed where farm sizes are not extremely small and scattered to reduce administrative expenses of premium collection, record keeping and claims settlement.
4. The land tenure systems of a country must provide incentives for good land use and enhance productivity.
5. There must be availability of trained personnel trained in efficient farming and insurance.
6. Complementary programmes such as training of farmers, reliable supply of inputs, research and development of better seed varieties, and flexible lines of credit all play a complementary role of the success of crop insurance.

2.6 CASE STUDIES

2.6.1 Agricultural Insurance in Zimbabwe

Zimbabwe faces a number of weather related risks, just like any other Southern African Nation. Areas like Muzarabani and the Manicaland Province are mostly affected by floods coming from the coastal areas of Mozambique and Madagascar. Zimbabwe has also been receiving less than proportionate rainfalls over the past decades, with drought affecting the agricultural outputs for most farmers. The fall in agricultural output is affecting the economic performance of the country as its economy is agro based. (*E Makaudze, 2005)*

A recent study by economist William R. Cline (*Global Warming and Agriculture: Impact Estimates by Country*) predicts a 39-47 percent decline in agriculture in southern Africa by 2080 if greenhouse gases escalate at their current pace. That is potentially deadly news

for farmers in southern Africa where the population threatened by food shortages almost doubled from 3.1 million in 2006 to nearly 6.1 million in 2007.

2.6.2 Current crop insurance cover

The nonavailabilty of a comprehensive insurance programme is further worsening the challenges faced by farmers in their quest to manage the risks they face. Different insurers are coming up with different schemes, some of which shall be discussed later in this document. However, a general crop insurance cover will be having some of the following features;. Some schemes are a specific perils approach in which only a few named perils are included in the cover. Usually those are the perils, which have caused losses in the past. However, the narrower the cover scope, the greater will be the need for other government programmes like disaster relief and to fill the uninsured.

Under the comprehensive approach, cover is wide and is not limited to weather hazards but can extend to include things like plant disease, insect damage, and other causes of loss over which farmers have little or no control. A comprehensive approach produces stable results than a specified perils approach.

(a) Yield insurance

In case of crop yield or harvest insurance (multi-peril and all risk cover) a grower is indemnified, if his crop production falls below the equivalent of a certain guaranteed yield per unit area. This approach has often led to serious moral hazard problems, if the insured farmer does not act in good faith and fails to apply good crop husbandry and farm

management practices. The alternative is coverage against actual damage caused by specific named perils such as fire, windstorm, hail frost, floods and excessive rain coupled with the inability to harvest (e.g. in the case of growing of tomatoes for industrial processing and vegetables for export). The emphasis in viable crop insurance programmes is on a limited range of clearly specified risks with the amount insured usually linked to the investments made in growing the crop. The covered perils should clearly address the main concerns of the growers, while as experience is gained it is always possible to expand the range of perils (and crops) involved in the programme.

Other areas covered by a basic insurance cover include

(b). Fire and allied perils

This covers against loss or destruction of or damage to the property of the insured caused by fire (whether resulting from explosion or otherwise),lightning, earthquake, explosion, riot, strike, and malicious damage, storm and special perils, and all other contents like money, documents, and all important documents and goods belonging to employees or directors. This policy also covers; architects fees, capital addition, contract price, cost of demolition, and fire brigade charges

(c) Burglary policy

This covers the insured against any loss resulting from violent and forcible entry or exit from any buildings on the farm resulting in theft of farm equipment and property.

(d) Livestock

This covers the insured against death or injury to livestock whilst at the farm premises. The death might be accidental death or resulting from specified perils such as anthrax, sleeping sickness etc.The livestock covered include; dairy cattle, beef cattle, pigs, ostriches and chickens, and all other domesticated animals whose existence and safekeeping at the farm gives the farmer a financial gain, and whose death or injury result in a financial loss.

It should be noted that the most inevitable and severe risk that most farmers in developing nations face is the weather variability. It is therefore important that in coming up with developments in the crop insurance schemes, great emphasis should be placed on weather variability, drought insurance, effective land use and management, more efficient ways of farming and productivity enhancing policies.

2.6.3 Exclusions

In most policies in , the following perils are usually excluded;

1. pest attack
2. drought
3. loss of farm property or livestock due to war, invasion act of foreign enemy hostiles or warlike operations
4. death/ injury or livestock resulting from poor or inadequate livestock management
5. any legal liability resulting from use of nuclear weapons

6. confiscation or detention of property by lawfully constituted authority
7. loss resulting from contamination, pollution unless the contamination is caused by an insured peril (source: *Capitol Insurance Brokers Agriculture Insurance policy wording)*

It can be noted from the above that the policy does not cover the major risks that the Zimbabwean farmers are facing notably drought, poor land use and management, price fluctuations in agricultural output, and pest attack.

2.6.4 Alternative Risk Management Mechanisms being employed

(a) *Better Farming Methods*

While increasingly grim forecasts predict agricultural declines in southern Africa due to climate change, a farming method called Conservation Agriculture (CA) was introduced in Zimbabwe in 2005 by FAO and CARE Zimbabwe, a NON Governmental organisation. CA is a method of farming that minimizes soil disturbance, applies more precise timing for planting and utilises crop residue to retain moisture and enrich the soil.

The International Crops Research Institute for the Semi Arid tropics recorded harvest figures for the 2004 -5 and 2006 seasons from farmers using conventional methods and a CA method. In seven out of eight districts it was tested that the CA system provided a higher yield. In 2005-6 in the Hwange district in the North West of Zimbabwe, maize yields were 1,700 per hectare with conventional farming methods compared to 2,500 kg per hectare when CA methods were applied. In 2004-5, farmers yielded approximately

790 kilograms per hectare with conventional farming and 1,100 kg per hectare with basin tillage. (*http:///www.icri.org)*

CARE reported that 154 farmers began using conservation techniques in 2004 in the South Eastern Masvingo district. Their substantially improved yields have convinced others to try and now there are 1,081 farmers using CA in Masvingo. The number of people needing emergency food assistance in the area is reported as having dropped dramatically in two years. *(IRIN 2007)*

(b) ***Agricultural Sector Production Enhancement Facility (ASPEF)***

ASPEF was introduced in 2005 by the Reserve Bank of Zimbabwe following the announcement of the 2004 2005 Drought Mitigating Monetary Policy Framework to provide capital and working capital finance to agriculture and related activities and exporters at concessional interest rates. This was in recognition of the critical role played by agriculture in the Zimbabwean economy, with the sector contributing about 18% of the country's Gross Domestic Product.*(www.rbz.co.zw)*

The broad objectives of the facility are:

i) To enhance food security;

ii) Foreign currency generation through exports;

iii) Foreign currency savings through import substitution on food and related products;

iv) Stimulate a positive supply response in key sectors of the economy;

v) Price Stability; and

vi) Employment creation

Under this facility, farmers are given loans at discounted interest to buy inputs and loans for harvesting their crops. To complement this, Grain Marketing Board of Zimbabwe (GMB) also supplies inputs to farmers on credit. This facility is done in conjunction with the Agricultural Development bank of Zimbabwe. The ASPEF facility can contribute towards increasing agricultural productivity through provision of cheap financing methods. It however does not address the risk management side, as there are no facilities to manage the risks that farmers are exposed to. This will thus leave farmers exposed despite the availability of capital. *(www.rbz.co.zw)*

(c). Farm Mechanisation Programme

The Reserve Bank of Zimbabwe also launched a farm mechanization programme where they are supplying farm equipment to farmers to enhance efficiency in their farming activities. This facility, when effectively utilized, will replace the poor farming methods being employed by farmers with new and more yielding methods, which prevents some of the risks that farmers face *(www.rbz.co.zw)*

(d) ***Winter Ploughing and Irrigation***

As a measure to reduce the impact of drought, the government is embarking on various irrigation projects in communal areas, which also has seen the advent of winter ploughing. Irrigation schemes are a risk management tool to solve the problem of drought since by employing such a farmer will be guaranteed of adequate farming for their crops. It is however very difficult for such schemes to cover the whole country in a short space

of time, given the urgent nature of Zimbabwe's precarious food situation *(Herald, November 30 2007)*

(e) ***Research and Development***

The Ministry of Agriculture recently formed a research body, which was mandated to conduct researches on best farming methods and risk prevention measures to enhance increased agricultural output (*The Herald 18 February 2008)*. Researches are likely to promote effective land use and reduce likely claims arising from ineffective land use and poor risk management. This may then ensure the viability of the conventional insurance covers as they have been failing due to amongst other issues high rates of claims and moral hazards. The other reasons could be;

- The catastrophic nature of the risks inherent in agriculture, which makes the insurance premiums very high and unavoidable
- The unavailability of data regarding the nature and extend of the risks to be covered
- High costs of administering the scheme due to the concentrated nature of farms and their smaller sizes

2.7 Agricultural Insurance in Developed countries

In June 2000, Unites States enacted the Agricultural Risk Protection Act which is reported to have significantly changed the manner in which the Risk Management Agency (RMA) conducted research and development on behalf of America's Federal crop Insurance Corporation. The Risk Management Agency made many studies on the

feasibility of developing new risk management for crops and livestock. The Federal crop Insurance Act (Section 508(h)) permits anyone to develop policies or plans of crop insurance, and if anyone develops the policy, they will be reimbursed for their research and development costs and maintenance costs. (*IRMI Update 2000)*

This gives an incentive for Insurance companies to research more on better methods to reduce risks. In 2001, several new plans of Insurance were submitted and approved including; Livestock Risk Protection Program, Crop Revenue Program, and Drought Insurance. Drought Insurance will provide indemnity to the farmers for financial loss resulting from a drought. The package would also extend to provide guidelines on best farming practices that farmers may implement to ensure a maximum yield. There is also the Non Insured Crop Disaster Program (NAP), which provides financial assistance to producers of non-insurable crops when low yields, loss of inventory, or prevented planting occurs. (Skees 2002)

2.7.1 Developments in agricultural insurance

(a) Weather Insurance

Weather insurance is a creative product that can be used for situations ranging from sales promotions to income stabilization. Unlike regular insurance, which would only cover physical damage, weather insurance protects against additional expenses or loss of profit stemming from a specific weather event. Weather insurance tends to cover high-risk, lower probability events while weather derivatives protect against lower risk, higher probability events. High risk, lower probability events include hurricanes, snowfall

exceeding criteria limits on certain days, rained-out events, etc. Lower-risk, high-probability events include cool summers and warm winters, which can affect revenues, expenses and cash flows for businesses of all types. *(A Slangen 2002)*

(b) Weather derivatives

A weather derivative is a financial instrument that has a payoff derived from one or more independently measurable weather factor(s) like temperature, snow depth and many others. Weather derivatives shield revenues against lower risk, higher-probability events like a mild winter. Hedging, by definition, is a means to engage in a transaction that partially or fully reduces a prior risk exposure. Derivatives pay based on the difference between a negotiated "strike price" and the actual weather (or the total of weather related index). (*Jerry Lettre,2007)*

The growth in derivatives trading over the recent years reflects the increased economic benefits which futures markets provide to market agents. These benefits are mainly price discovery, market transparency and risk management through hedging. Price discovery is the process of revealing information about current and expected spot prices through the futures and forward markets. Risk management refers to hedgers using derivatives contracts to control their spot price risk. The dual roles of price discovery and hedging provide benefits that cannot be offered in the spot market alone and are often presented as the justification for futures trading. Futures market prices are used as the reference for all the US revenue insurance products. (*Meuwissen, Huirne and Hardaker 1999).*

(c) Income insurance

It is potentially more attractive to farmers than other forms of insurance (e.g. yield, price), because it deals with losses affecting farmer's welfare more directly (Meuwissen 2000). It could be based for instance on net farm income of family workers (farm revenue, - including subsidies, minus variable costs, taxes, depreciation, rent, interest and compensation of employees).

(d) Index Insurance

Index insurances differ from the other type of insurances in that the indemnities are not computed from the individual farmer loss but from a parameter or index external to the farm. They have been divided into two categories: area-index insurance (the index is directly an area average yield or income) and indirect-index insurance (other kind of indices, such as the vegetation indices computed from satellite images). The reason for this division is that the latter are more complex and so more difficult to understand or to trust by the farmers. *(Skees et al. 2005)*.

The area-index insurance are most often based on the yields of an homogeneous area, so that if the area yield decreases below a given value, all the insured farmers in that area get an indemnity with independence of their having a loss or not. An example of this is the GRP or Group Risk Plan in the USA. Regarding the indirect indices, the World Bank is promoting this kind of products as a tool for developing countries, sometimes for the individual farmers, other times for the Governments, so that they get funds to give aid to the rural population when there is a catastrophe *(Skees et al. 2005)*.

(e) Calamity funds

The calamities funds and ad-hoc aids are all aids given by the Provincial Governments under the declaration of catastrophes. The ad-hoc aids are ex-post aids, which have to be budgeted after a catastrophe has occurred while Government provides and regulates the Funds every year. The main advantage of the funds over the ad-hoc aids is that they avoid big distortions of the government budget. Funds sometimes receive also contributions from the private sector, usually compulsory, in the form of levies to production, levies to premiums. *(Skees, Hazell, and Miranda, 2006)*

(f) Catastrophic Bonds (CAT Bonds)

The CAT bonds (catastrophe bonds) provide the opportunity for catastrophic insurance in light of hurricanes, floods, earthquakes, tornados, etc. CAT bonds are a recent innovation that has the potential to make insurance for natural disasters more affordable and more accessible even in developing countries. CAT bonds are tradable financial assets that provide the holder with large amounts of capital contingent upon the occurrence of some catastrophic event. The coupons and principle payments on the bond depend on the performance of an index or pool of natural catastrophe risk, having the potential to be used as an indirect measure of agricultural losses. This means that the transaction is parametric, whereas the payments are tied to some statistic where the probability distribution can be estimated and the event measured.

The bonds are usually offered by financers (special purpose reinsurers) who use the capital raised to offer reinsurance or insurance products to individuals facing and wanting to share the risk of losses from the catastrophic event. CAT bonds have been successfully implemented in the USA, Japan, and are being analyzed for implementation in developing countries. *(Skees et al 2000)*

(g) Stabilization accounts

Stabilization accounts are a form of self-insurance. They consist on individual accounts where farmers put an amount of money every year, which they can withdraw in a year of big losses.

2.8 Conclusion

With the recent developments in the agricultural insurance in developed countries having immensely enhanced increased food productivity and risk reduction, calls are being made to tailor these products to developing countries. The fact that these strategies have worked in developed countries presents a high chance of them being fitted in the developing world *(Mark Wenner, Diego Arias, 2003)*. However, we need not to overlook the fact that there are various rigidities in the developing world, which may hinder the successful implementation of these strategies. In light with the inadequacy of the crop insurance schemes in the developing world, it is apparent that a situational approach be taken in coming up with the most feasible and comprehensive agricultural insurance scheme for a given country or area.

CHAPTER THREE

METHODOLOGY

3.0. INTRODUCTION

This chapter presents an overview of the research methodology. Research requires a systematic approach to finding answers to research problems (Saunders et al, 2003). The credibility of the research findings depends on the appropriateness and reliability of the methods used in data collection and analysis process. This section highlights research instruments used in the data collection and the justification for their use. It also highlights research data, data sources and data collection plans. A thorough review is made of data analysis procedures and the justifications for their use. The chapter concludes with a summary of the research methodology.

3.1 RESEARCH DESIGN

The research design used to obtain knowledge on the impact of crop insurance on ensuring food security in Zimbabwe is a descriptive design. Due to the nature of the data gathered by the researcher data analysis will be both qualitative and quantitative.

3.2 SAMPLE POPULATION

A sample is an identified group of individuals, households and institutions that can be reached by mail, telephones or in person and who posses information relevant to solving the problem at hand. Thus it is a method of selecting items or elements from a given universe. Depending on the actual number of beneficiaries, a sample was drawn for the

impact assessment study. The study covered 5 commercial farms that engage in large scale farming. The farmers were interviewed and completed questionnaires. Sample farmers were considered to be a true representative of the target universe.

3.3. DATA COLLECTION

Data was collected from secondary and primary sources.

3.3.1. Secondary Data Collection

Secondary data is data that is already available having been collected by other researchers for some other purposes. It is usually used where the facilities for survey are not readily available. Journals, Magazines, textbooks and research papers about microfinance are some of the secondary data that the researcher used

3.3.1.1. Justification of Secondary Data

1. This method was convenient approach for the researcher. It was cheap, quick and readily available. It helped to refine research questions and design further research objectives.

2. It also saved the researcher's time to complete compilation of the final project since the information relating to the impact of crop insurance in Zimbabwe was readily available from different libraries and the internet.

3. Secondary data consolidated primary data obtained from personal interviews. This combined theory and practice to come up with a well balanced research on the impact of crop insurance in Zimbabwe.

3.3.1.2. Disadvantages of Secondary Data

1. Secondary data compelled the researcher to consult a lot of literature relating to the impact of crop insurance globally, thus a bulk of information was irrelevant. However, only literature with current information relating to crop insurance in Zimbabwe was considered.

2. Data collected about the different crop insurance may not have been very accurate. The researcher had to compare different sources then come up with the correct and accurate information to be used during the research.

3. There was also a huge chunk of outdated data relating to the crop insurance.

Therefore the researcher had to use recently published magazines, books and journals.

3.3.2. Primary Data Collection

Primary data is defined as data expressly collected for the purpose at hand. The great advantage of primary data is that exact information sought is obtained. Data collected primarily for this research was done through the use of questionnaires and interviews.

3.4. SURVEY IMPLEMENTATION

A walk through survey was conducted before the distribution of the questionnaire. The survey by observation was meant to note organizations to which questionnaires could be

disbursed to for completion in order to avoid being turned away. To get a high response rate the researcher had to make repeated personalized attempts to contact and encourage potential respondents to participate in filling the questionnaire and to solicit for interviews. The questionnaires were self administered to allow enough time for answering as some of the questions needed reference to bank records. Questionnaires were handed in personally and collected later as per appointment.

3.4.0 QUESTIONNAIRE DESIGN

The design of the questionnaire was guided by the research objectives. Introductions and transitory statements that briefly explained to the respondent what kind of questions there were going to get and why were used. This was done to make the organization of the survey apparent to them hence making the questions easier to answer.

Questionnaires were sent to managers of crop insurance to get their views on the outreach and sustainability of crop insurance in Zimbabwe. The questions were structured in such a way that an in-depth view of the operations of crop insurance could be obtained. Questions were standardized in order to reduce the time and effort required from respondents. Closed-ended questions were used to help respondents to answer questions quickly without thinking too much. Open-ended questions were also used to solicit respondent's opinions.

3.4.1. Justification for the Use of Questionnaires

1. Firstly, simply delivering questionnaires to the farmers, with the objectives of the research, saved a lot of time.

2. Questionnaires helped in avoiding bias since the researcher was not there to influence responses from respondents.

3. Respondents were given ample time to think and fill in the questionnaires and seek clarification where it was necessary.

4. Lastly, questionnaires also allowed uniformity in the way questions are answered especially for closed-ended questions which made it easier to process the data.

3.4.2. Disadvantages of Questionnaires

Regardless of the benefits derived from the use of questionnaires in this research, setbacks were however encountered.

1. The major problem was that some of the questionnaires were not posted back in time and some were not even posted back, so personally delivering and collecting some of the questionnaires helped a lot. Secondly, some of the respondents could not understand the questions being posed in the questionnaire. Due to this the researcher, visited some respondents and clarified the questions on the questionnaires.

3. Designing the questionnaire required a lot of time and skill from the researcher so as to achieve the desired objectives.

3.5. INTERVIEWS

Interviews were conducted to be a foil for data gathered through questionnaires. This gave the researcher an opportunity to explore the subject matter of the research in detail. The interviews were targeted at farm owners. The respondents were given the opportunity to express their thoughts on the topic of interest as freely as possible but an

interview guide was also used to avoid loss of focus and to ensure that all relevant questions were asked.

3.5.1. Justification for the use of Personal Interviews

1. The researcher was able to obtain detailed information about the personal feelings, opinions and perceptions of respondents concerning the research. This helped to deepen the understanding of the researcher and was helpful in explaining statistical data.

2. They gave the researcher a chance to give explanation of the purpose of the study more convincingly than a covering letter in the case of a questionnaire.

3. Interviews also made it easier to get information from respondents with reading and/or writing difficulties.

3.5.2. Disadvantages of Personal Interviews

1. Interviews were much more expensive than postal questionnaires in the case were the interviewer has to travel long distances to reach respondents. As a result of this, the researcher mostly used questionnaires since the time allocated for the study was limited this was time saving and also cost effective because the researcher simply had to post or deliver the questionnaires and wait for responses.

2. The face-to-face situation of the interviewer and the respondents also led to bias since the respondents could be influenced by the interviewer and hence could not disclose some important information. However the researcher took note of the respondent's expressions seriously to get the other hidden information.

3. Time consuming as the researcher could only manage to interview one or two people a day meaning that coverage was quite minimal, since quality time had to be spent with each respondent.

3.6. DATA PRESENTATION

Quantitative data was collected and tabulated in chapter four. These tables provide an easy reference to data. The choices of tables as data presentation tools detract from their ability to clearly classify different data. Pie charts, bar graphs and line graphs were also used. Their choice is mainly based on visibility and their ability to show trends more clearly. Data analysis started by sifting through all the data, removing whatever is irrelevant and bringing together what is important. This idea allowed the most significant observations to emerge from all data gathered in the field, while reducing the volume of data.

3.7. CONCLUSION

The preceding chapter outlined the research design used, which was a qualitative survey through personal interviews and questionnaires. Methods used to collect data, which are secondary and primary data, were discussed. Lastly the methods of data presentation and analysis procedures were also described. The following chapter focuses on data presentation and analysis of the results of the study.

CHAPTER 4

DATA PRESENTANTION AND ANALYSIS

The principal research instruments used were questionnaires and personal interviews. This chapter gives a presentation of the data obtained from the survey, and an analysis of the results.

4.1 QUESTIONNAIRE RESPONSES

4.1.1 PROFILE OF RESPONDENTS

The preferred respondents to the questionnaire were the farm managers and farm accountants. However, very few managers were willing to participate in the research as they seem not to be aware of the existence and operation of crop insurance. The researcher had to resort to farm owners where they were available. The researcher also had to interview three insurance companies namely Agricultural Insurance Company of Zimbabwe, Jupiter Insurance Company and Clarion Insurance Company, who have been promoting crop insurance and are offering one of the best covers in the country. The response was overwhelming though the interviewees were cautious in their responses, given the sensitive nature of agriculture in the country.

4.1.2 THE SAMPLE FRAME

The questionnaire was designed for Commercial farmers (divided into small scale and large scale), and Subsistence farmers. The response was overwhelming given the

sensitive nature of agriculture. However the problem of getting in touch with these farmers was a problem as most of them had other businesses which they were attending to, and thus either could not find enough time to fill the questionnaire or misplaced the documents. Table 4.1 shows below shows the sample frame

Table 4.1 The sample frame for the questionnaire.

Respondent	Questionnaires Dispatched	Questionnaires Returned	Response Rate
Small scale commercial Farmers	5	4	**80%**
Large scale commercial farmers	5	5	**100%**
Subsistence Farmers	5	3	**60%**
TOTALS	**15**	**12**	**80%**

Source: Primary data

The high response rate shows willingness by farmers to take part in the structuring of comprehensive crop insurance and can be an indicator of effective demand amongst the farmers. Crop insurance has a potential of positively affecting farmers' incomes, which could be one of the main reasons for the 805 response rate.

The response rate can also give an indication that the farmers in Zimbabwe, as represented by the sample, are risk averse. This reveals that they are willing to try new

and various methods of managing their exposures and as such develop interest on each method that may come out.

4.1.3 AN ANALYIS OF THE QUESTANAIRRE RESPONSES

4.1.3.1 Risks that mostly affect farmers

Farmers in different regions cited different risks that mostly affect their incomes. The risks may vary according to crop type but the questionnaire results showed that these risks are almost the same, as shown in the table 4.2

Table 4.2 Distribution of responses on which risks mostly affect farmer's incomes

Respondents	Drought and Excessive Rainfall	Inadequate weather predictions	Poor farming methods	Soil Infertility	Poor timing	Price Risk	Gvt Policy	Total
Small Scale Commercial Farmers	40%	30%	5%	9%	5%	10%	1%	**100%**
Large Scale Commercial Famers	27%	15%	8%	5%	5%	15%	15%	**100%**
Subsistence Farmers	40%	40%	5%	8%	5%	0.8%	1.2%	**100%**

Source: Primary data

The table shows that mostly farmers are adversely affected by drought and / or excessive rainfall. This implies that a successful crop insurance programme must cover the risks drought and excessive rainfall more comprehensively. The nature of drought however is

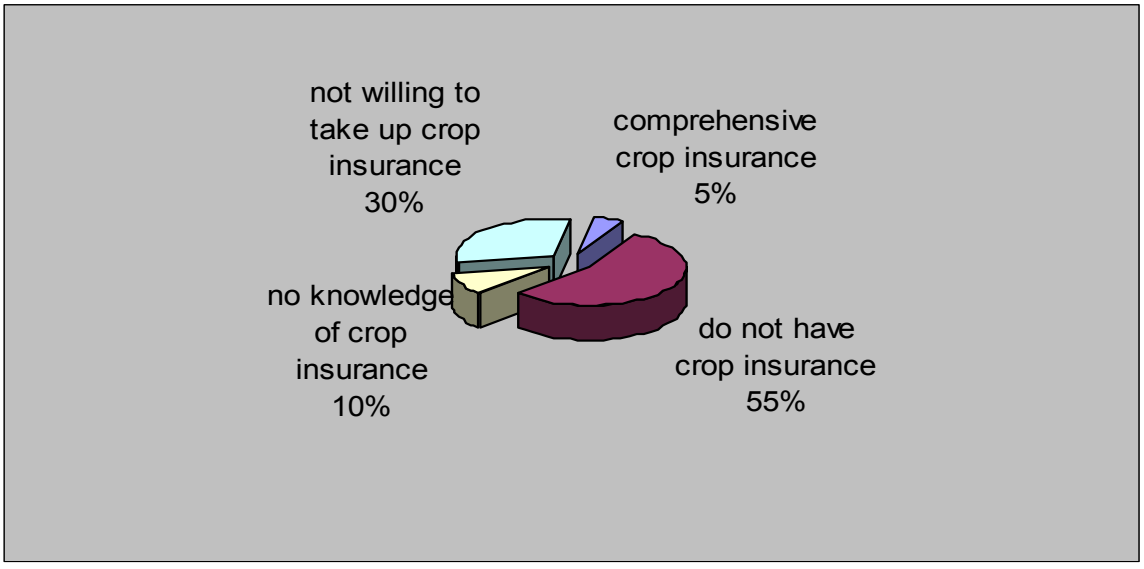
such that it cannot be avoided (unless if one makes use of irrigation) hence the insurance against such is likely to attract high premiums and stringent underwriting.

The table further shows that farmers are also greatly affected by inadequate weather predictions. A successful crop insurance programme will thus entail the engagement of weather bureaus and ensure they are adequately equipped to give accurate information always.

4.1.3.2 Perception towards crop insurance

Knowledge of farmer perceptions towards crop insurance is very important in determining the success of crop insurance as this will determine effective demand for crop insurance as well as level of cooperation rendered by the farmers. Figure 4.1 shows the distribution of farmer responses showing their attitude towards crop insurance

Figure 4.1 Distribution of farmer attitude towards crop insurance



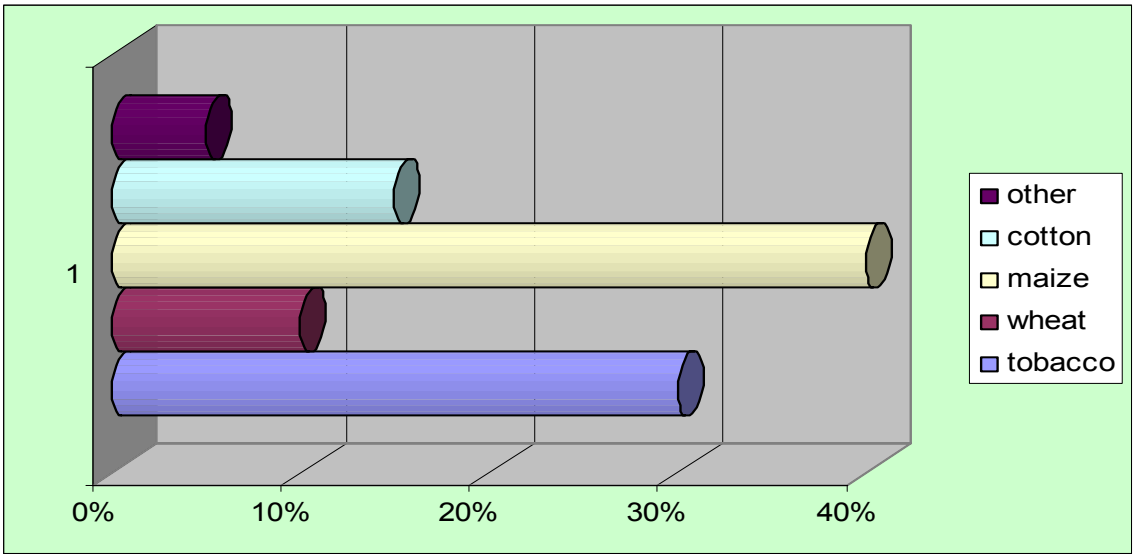
Source: Primary data

The interviews established that most of the farmers were not insured. This narrows the information and statistics base for past loss histories of the farming risks. It will be therefore difficult to insure a risk whose information is not available. The successful implementation of crop insurance will call for more farmers to have their crops insured, for the law of large numbers to be effected. However this might be a daunting task as a large proportion of the interviewed farmers showed no interest in crop insurance, implying that aggressive marketing will have to be conducted

4.1.3.3 Distribution of land usage by crop type

Whilst land utilisation by crop type can vary from season to season and from region to region, the survey illustrated in figure 4.2 shows a picture of how the land is distributed according to crop type in Zimbabwe

Figure 4.2 Distribution of land usage by crop type



Source: Primary data

The results obtained on the land usage may have been distorted due to the fact that the study was concentrated in a few parts of the country where some of the crops may not be grown. However the data revealed that most farmers are into maize production, followed by tobacco, cotton, and wheat. This implies that the risks that affect maize are the most risks that most farmers are worried about, hence comprehensive crop insurance should give a more weighting to risks associated with maize and tobacco production

Maize, cotton and tobacco are very vulnerable crops and need careful attention in nursing them. Since they are the most planted crops, there is likely to be a high claims frequency. If the premiums are not adequately priced, this class of business might experience technical losses and thus becomes unprofitable. This situation is highly likely given a likelihood of government intervention in the pricing of crop insurance

4.1.3.4 Classification of Zimbabwe by natural regions

Different regions in Zimbabwe have different specific attributes and risks which might therefore call for a tailor made crop insurance for region. An analysis of these regions and their associated risks and conditions is therefore essential in determining the appropriate crop insurance, if need be. Table 4.3 gives a descriptive outline of the natural regions in Zimbabwe

Table 4.3: Classification by natural region

Natural Region	Area extent (million ha)	% Total land area	Annual Rainfall (mm)	Agricultural Productivity
1	0.62	1.6	>1000	Suitable for dairy farming, forestry, tea, coffee, fruit, beef and maize production
2	7.31	18.8	750-1000	Suitable for intensive farming based on maize, tobacco, cotton and livestock
3	6.85	17.6	650-800	Semi-intensive farming region. Severe mid-season dry spells are common. Suitable for livestock production, together with production of fodder crops and cash crops under good farm management.
4	12.84	33.0	450-650	Semi-extensive region. Subject to periodic seasonal droughts and severe dry spell during the rainy season. Suitable for farming systems based on livestock and resistant fodder crops. Forestry, wildlife/tourism.
5	11.28	29.0	<450	Extensive farming region. Suitable for extensive cattle ranching or game ranching. Zambezi Valley is infested with tsetse flies. Forestry, wildlife/tourism.

Source: The experience of Resettled Farmers in Zimbabwe, Sophia Chiremba and Williams, 2000

The relevant regions under study here are mostly region one to three where crop farming is the main activity. The table also gives an indication of the types of crops that can be best grown in each region. From the analysis it appears that most of the land is not suitable for crop farming as 79.6% of Zimbabwean land is not suitable for intensive crop farming. This can thus pose a question of whether the 21.4% of arable land can provide food security to the nation.

4.1.3.5 Annual revenue figures realized by farmers across regions

The mean revenue figures help us in knowing which areas are more productive hence which areas are more exposed to farming risk (table 4.4). It also gives the insurers an indication of up to which level can revenue figures fall for them to chip in to indemnify the insured for loss of revenue

Table 4.4: Net farm revenue across provinces in Zimbabwe (US$/ha)

PROVINCE	MEAN NET FARM REVENUE
Manicaland	281.31
Mashonaland Central	915.23
Mashonaland East	499.93
Mashonaland West	240.23
Masvingo	231.71
Midlands	375.13
Total Sample	355.89

***Source**: Climate change and African Agriculture Policy Note No. 11, August 2006, CEEPA*

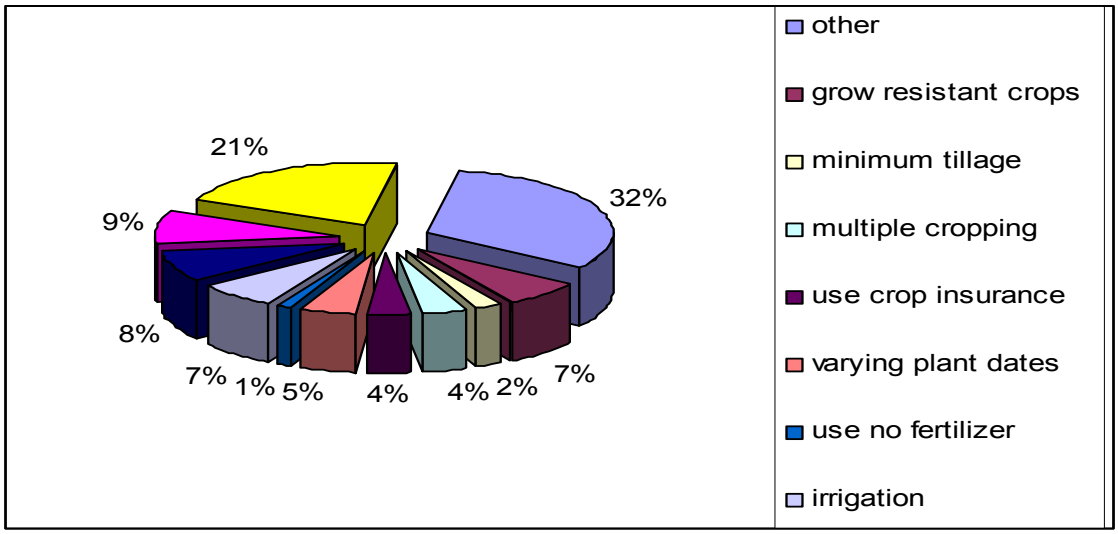
Mashonaland central has the highest mean net revenue, followed by Mashonaland East and Midlands. These areas have good soils for crop farming and as such yield is expected to be high. Comprehensive crop insurance should thus focus more on these regions and maybe try to be tailor made to suit the conditions and match the risks in the other regions.

4.2 FARMERS RESPONSES TO VARIOUS RISKS

4.2.1 Farmer responses to climatic risks

Climatic risks were established to be the most adversely affecting farm incomes. Because of this, a comprehensive crop insurance programme must be more centred along this risk and its comprehensiveness can be determined by the degree of coverage of climatic risks. Figure 4.3 shows the response strategies to these risks

Fig4.3: Farmer response strategies to Climatic Risks



Adapted from: Centre for economic policy in Africa, 11 August 2006

The results were adapted from a survey conducted by the centre for economic policy in Africa in 2006. The data bears testimony that the majority of the farmers use the traditional methods of managing farming risks. This can pose another stumbling block for the successful implementation of crop insurance. It can also prove costly for insurers as they have to engage in aggressive marketing inn trying to create awareness of their products

Most of the commercial farmers use irrigation facilities. This seems to be a major risk prevention tool used by most of these farmers. However this may adversely expose them because irrigation does not eliminate all elements of climate risks. For instance if there is drought, then there will be no water from which to draw from using irrigation facilities.

During the survey, it was observed however that actually most of the farms either had no irrigation equipment or the equipment had been vandalised and not capable to cover all the crops

4.2.2 Risks covered by the current crop insurance

A survey was conducted in the quest to establish the coverage depth of the current crop insurance scheme in Zimbabwe. Table 4.5 shows the distribution of responses on the risks being covered by crop insurance

Table 4.5 Distribution of responses on the risks covered by their crop insurance

Risks	Percentage of respondents whose insurance covers the risk
Climatic Risks	5%
Sanitary	45%
Man-made	3%
Yield / Production Risks	20%
Price Risk	15%
Financial Risks	12%

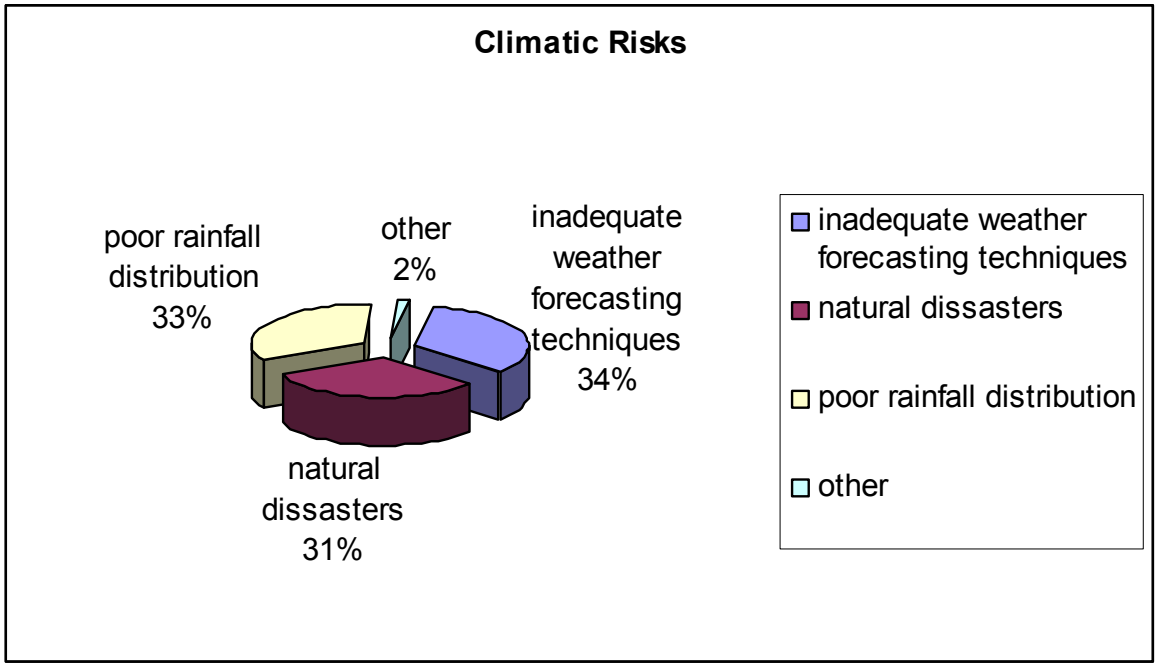
Source: Primary data

Given that Zimbabwe's farming industry is mostly affected by climatic risks, the 5% of the population whose crop insurance covers climatic risks clearly shows that the crop insurance is very shallow and may not greatly cushion the farmers against their risks. This might explain the industry tendency to negatively insure against farm risks and their reluctance to insure farmers and their crops.

4.2.3 Drivers of climatic risks

Respondents were asked to mark (in weights) the drivers of climatic risks. This was done in order to establish which drivers the crop insurance must focus more on in ensuring the reduction or comprehensive coverage of climatic risks. Figure 4.4 illustrates the responses of the farmers with regards to the drivers of climatic risks

Figure 4.4 Responses on the drivers of climatic risks (in weight of impact)



Source: Primary data

Most of the respondents figured out inadequate weather forecasting techniques as the main source of climatic risks. These include poor coordination between farmers and meteorological service centres, and or inadequate machinery to detect weather patterns. Equally, other respondents cited poor rainfall distribution as the driver for climatic risks. This can be attributed to the drought that has been consistent in Zimbabwe for the past 10 years. Zimbabwe, like any other part of the world, has also been experiencing changing weather seasons which results in poor timing as the rainfall distribution may not be as anticipated or as in previous years.

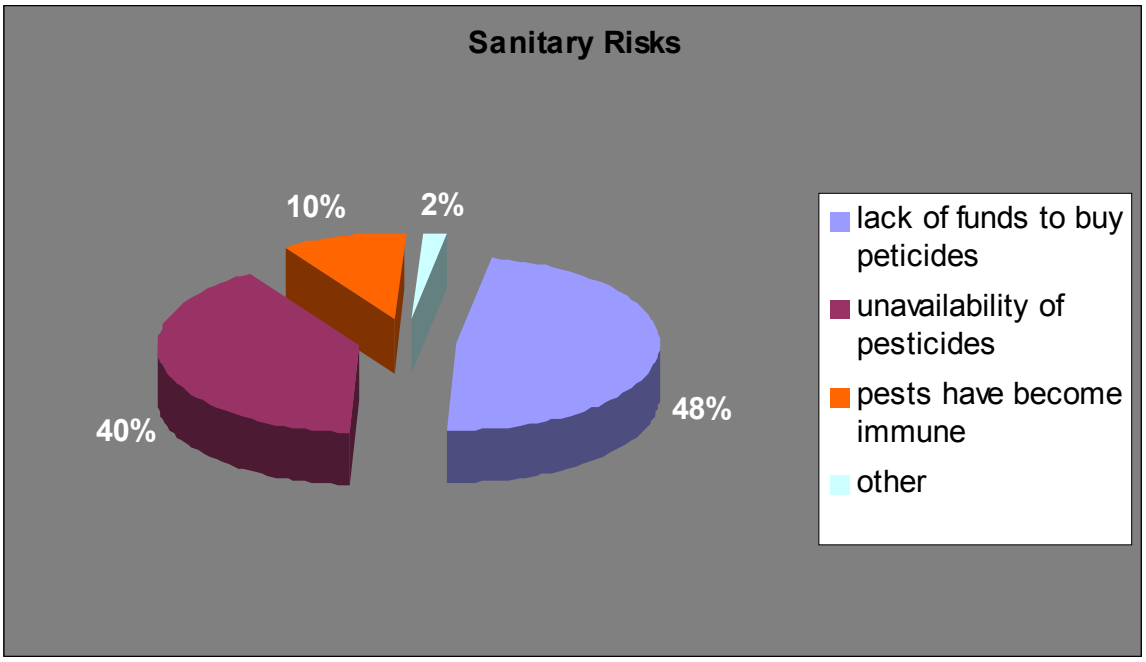
Also close to the same number of respondents (as with those who cited poor rainfall distribution and inadequate weather forecasting) attributed their climatic losses to natural

disasters. These were mainly people in Muzarabani and some parts of Manicaland which have experienced floods in recent years and have been greatly affected because of such.

4.2.4 Drivers of sanitary risks

Sanitary risks also affect farmers' incomes and the risks include plagues and diseases. Figure 4.5 shows the main drivers of sanitary risks as per responses by farmers

Figure 4.5 Responses on the drivers of sanitary risks (in weight of impact)



Source: Primary data

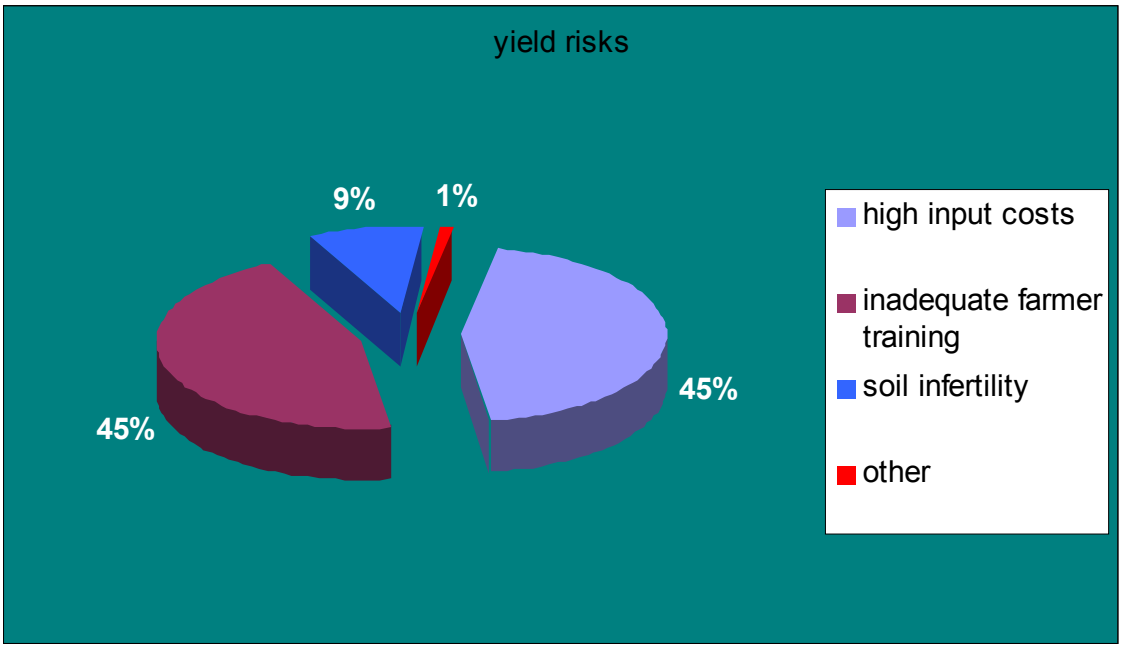
The figure indicates that most farmers do not have enough funds to buy pesticides. This can tell us that their yields are not enough to ensure they plough back their proceeds and ensure continuity in the farming business. The shortages of funds could also be as a result of poor farming methods which results in poor revenues. The shortages of foreign

currency and commodities in the local market seem to have hit the farming industry also as 40% of the farmers cited that the pesticides are not available on the market. Most farmers therefore are left in a situation where they end up not applying the pesticides at all.

4.2.5 Drivers of yield risk

Yield risks cannot be separated from climatic risks. This shows that if climatic risks are eliminated, eventually yield risks will be reduced. For a crop insurance program to successfully curb yield risks, the research sought for a substantive knowledge of its main drivers as shown by figure 4.6

Figure 4.6 Responses on the drivers of yield risks (in weight of impact)



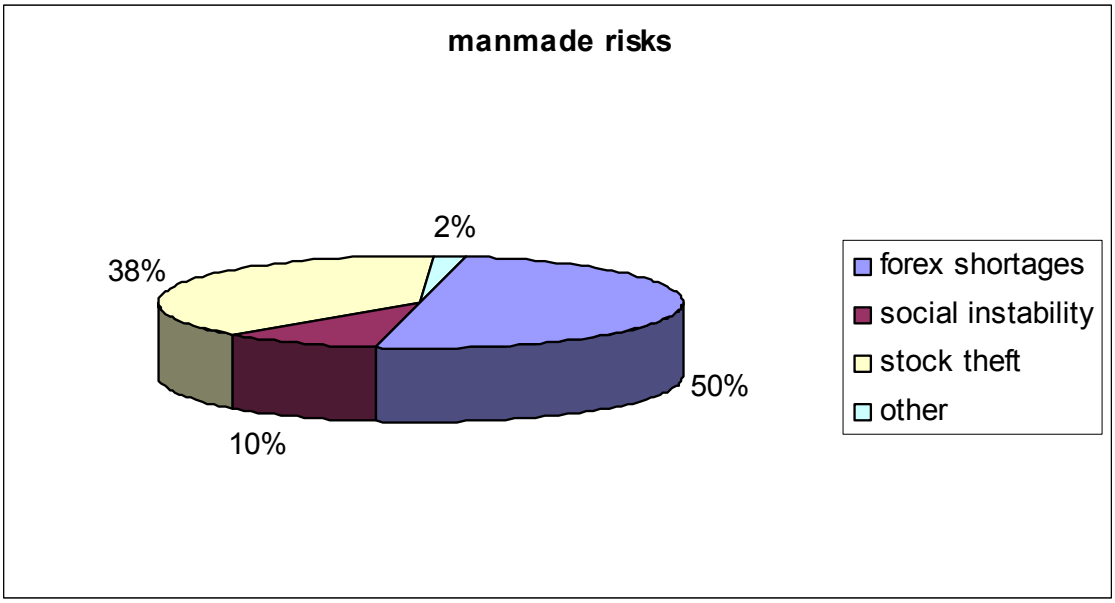
Source: Primary data

Most farmers (45%) attributed high input costs as the main driver of yield risks as shown in figure 4.6 above. The same percentage also cited inadequate farmer training as the major driver. This includes lack of farmer education programmes and unavailability and unaffordability of training facilities at farmer's disposal. It could also be due to reluctance by farmers to engage in these training activities or maybe the trainers set unfavourable conditions like selling of output to designated buyers who might be buying at unattractive prices

4.2.6 Drivers of man made risks

The man made risks can be related to political risks as the two can be used interchangeably. Political risks are very difficult to manage and as such careful attention needs to be done in designing a programme that manages this risk as well as realising profits for the insurer. Figure 4.7 overleaf shows the responses on the main drivers of man made risks which might give an insight on how best to curb man-made risks

Figure 4.7 Responses on the drivers of manmade risks (in weight of impact)



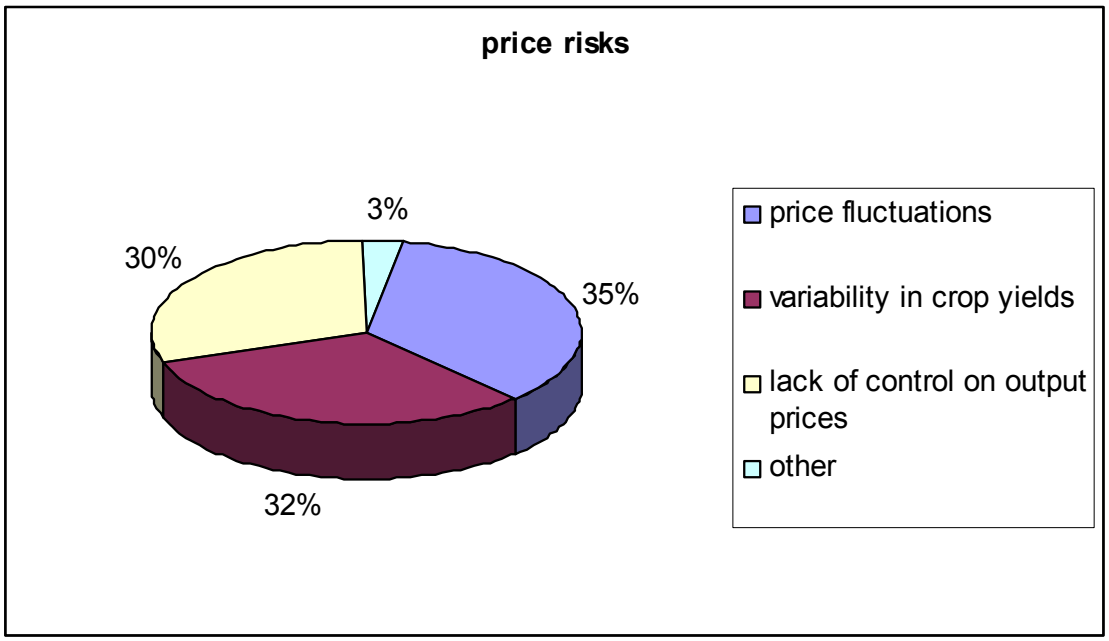
Source: Primary data

Most farmers attributed their manmade risks to foreign currency shortages. The rampant stock theft that has bee going on in the country was also cited as a major driver. Only a few were worried about the social instability in the country, though it might be a driver of the other driver like stock theft. The results clearly mirror the current forex shortages in Zimbabwe and the high degree of unemployment and stock theft cases prevalent in Zimbabwe. However the nature of political risks is such that it is difficult and can be unprofitable to insure against the risk, hence there is heavy reliance on government policies. The insurance players can thus engage the government in policy making to ensure that farmers are not very exposed to this risk.

4.2.7 Drivers of price risks

Price fluctuations directly affect farmer revenues and hinder proper financial planning due to uncertainties of prices. Price risks can be managed through the use of insurance derivatives like forward contracts. Determination of which strategy to use to curb price risks depends on which drivers are behind the specific price risk. Figure 4.8 shows farmer responses on the drivers of price risks;

Figure 4.8 Responses on the drivers of price risks (in weight of impact)



Source: Primary data

The responses show that price fluctuations, variability in crop yields and lack of control all affect the farmers with almost equal weighting. The price fluctuations are as a result of the surging hyperinflationary environment we are living in. The lack of control over output is as a result of government controls over the output prices of agricultural

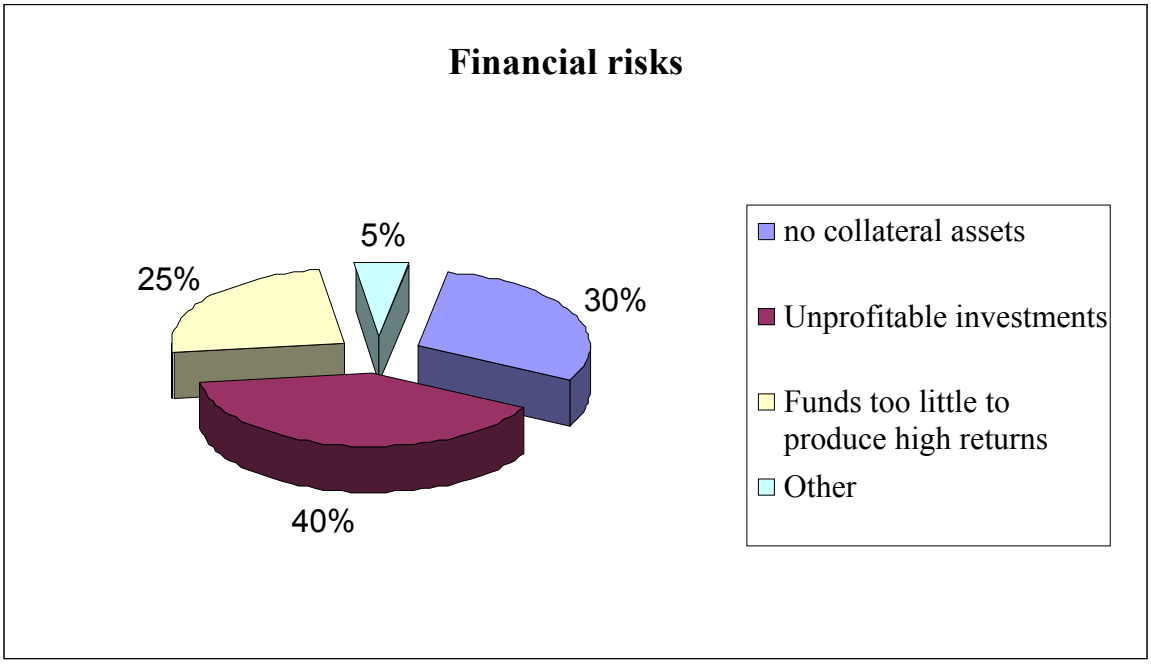
commodities, which impacts adversely on farmer revenues and reduces their potential revenue.

Variability of crop yields can be attributed to the drought in Zimbabwe, shortages in supply of inputs, or changes in quality of output. The government also can add in to the price risks by imposing price ceilings on agricultural commodities, a move that both reduces farmer revenue and profitability, and poses disincentives for farmers to produce more output of high quality as the prices may not make economic sense.

4.2.8 Drivers of financial risks

The major problem faced by farmers apart from natural risks, is financial risk. Most farmers are failing to raise enough finance to sustain their day to day operations. Given that their financial bases were strong, most risks like price risks, yield risks and manmade risks will then be reduced or eliminated. The research looked at the drivers of financial risk as shown in figure 4.9 overleaf

Figure 4.9 Responses on the drivers of financial risks (in weight of impact)



Source: Primary data

Most of the farmers do not have enough knowledge or expertise on how to best invest their funds as indicated by the pie illustration above. 30% of the population seem not to have enough collateral assets to finance for their inputs. Insurance can therefore step in to assist farmers in securing finance as they will be using it as collateral. However the facility is likely to be abused as farmers might just want to take insurance not for risk management reasons but because they would want to use it as collateral

4.3 CONCLUSIONS

The data obtained clearly shows that most farmers are resorting to traditional methods of insuring and are rarely using conventional crop insurance as a means of guarding against farming risk.

On the other hand, the existing crop insurance program is not sufficient enough to cover all the major risks that are faced by farmers. Most farmers are also highlighting that they are not affording to pay premiums for crop insurance, and a result are ending up not insuring at all.

However farmers were really cooperative and expressed interest in any developments in crop insurance as it will be a welcome move to the preservation of their assets. The farmers.

CHAPTER 5

RECOMMENDATIONS AND CONCLUSION

The study sought to find whether crop insurance is relevant in enhancing agricultural productivity and food security in Zimbabwe. The intention of this chapter is to establish whether crop insurance can enhance food security in Zimbabwe. The chapter will give an outline of recommendations in a more radical approach and a conclusion of the project.

5.1 The relevancy of agricultural insurance in enhancing food security in Zimbabwe

The research established that those farmers who had a crop insurance cover had better yields than those who had not. It was also observed that insurers were availing them with researches on best farming practices and training them in risk management and loss prevention

However agricultural insurance products have been characterized by problems of moral hazard and adverse selection, high administrative costs, and political interference in price setting. Insurers seem also reluctant to provide for such cover, citing unprofitability reasons as the claims ratios were exceeding premium incomes and the premiums are somehow regulated.

New insurance products that hold the promise of being more cost effective and at least eliminating moral hazard issues are emerging and have proven to be effective in developed countries like America. Area-yield indices are working well in the US but not so well in Morocco. Weather based insurance is also developing so well in the USA.

With these developments adopting the crop insurance schemes being used in developed countries may as well be useful in our Zimbabwean situation, given that the schemes are then modified to suit our situation.

5.2 Knowledge of crop insurance, willingness and ability to take up crop insurance

The research revealed that most farmers were willing to take insurance covers that give higher levels of coverage despite the cost. They also expressed preference on the contracts that pay out higher amounts in extreme droughts and huge crop losses. They were enthusiastic about the introduction of a new crop insurance scheme which would incorporate modern day risk management techniques like weather derivatives. They showed great interest in insuring their crops despite their financial constraints as they saw the advent of crop insurance as "more financially benefiting" than "cost increasing"

5.3 Can the recent techniques and developments being used by the developed world be incorporated to come up with the most suitable and comprehensive agricultural insurance scheme for the Zimbabwean situation?

Although a sample experiment to test the applicability of the recent developments in crop insurance was not conducted, the research drew its conclusions based on previous studies conducted. Morocco, for instance, used the USA crop insurance programme and it was successfully implemented and there was marked improvement in the nation's national output. South America has also realised huge economic benefits from the use of crop insurance and its agricultural output has been increasing over the past few years.

Because the schemes have worked in these developing nations, then there is hope and high chance that they will as well work in our Zimbabwean situation and help improve our agricultural output as well as minimise its loss

5.4 Are the conditions for successful crop insurance being met in Zimbabwe?

Most conditions necessary for a successful crop insurance program are not being met in Zimbabwe. The only conditions being met are the one that requires the land tenure systems to provide incentives for good land use and enhance productivity, and that which calls for availability of complementary programmes such as training of farmers, research and development of better seed varieties, and flexible lines of credit**.** It is very important therefore to note that for crop insurance to be successful, the first step will be to ensure that these conditions are met

5.5 Recommendations

The researcher recommends that Zimbabwean insurers first embark on extensive customer education programmes to ensure there is comprehensive and wide product knowledge amongst the farmers, before they start to sell their crop insurance products

There is also need for insurers to have a stable and reliable database and statistics on farming risks so that they will be able to properly manage their risks profiles. This will also facilitate the attainment of a balanced portfolio, loss controlling and proper pricing by the insurers

It may also be considered as economically reasonable to cover crops that are of great economic sense if crops that meet the following criteria have an insurance cover;

(a) Those that constitute a major share of total national production (maize, tobacco, cotton).

(b) Those crops that are subject to risk to which farmers are particularly sensitive or which significantly affect their economic and social needs like tobacco, wheat and maize.

(c) Coverage- target crops that have a significant effect on the balance of payment. These include wheat, maize, tobacco, and potatoes

(d) The scheme should cover more areas that have high concentration of commercial farming. The government can designate certain areas for certain crops for instance Midlands region can be designated for cotton production only. This move will lower the cost of insurance because of economies of scale and easy administration. This move however can be detrimental if a catastrophe arise in such an area and the whole nation will be affected due to this crop 'specialisation'

(e) Administration of the programme is very essential so that the programme is run in a more professional way that contributes towards stabilising the prices of farm products and enhancing continued productivity.

(f) Premiums Need to Adjust Frequently as New Information Becomes Available: Government run insurance programs tend to be reluctant to adjust premiums from year to year based on loss ratios and new available information out of political sensitivity.

Policyholders tend to complain vocally about high premiums. The failure to adjust premium rates undermines program viability.

(g) Set Insurance Sale Dates Well in Advance of Harvest Time and Honor Them*:* Selling insurance policies after closing dates, invites opportunistic behavior. More reliable and accurate information on weather becomes available the closer one gets to planting time. Farmers will use this information to their advantage. They will not buy if the weather forecasts are good leading to low income for the insurance company or they will buy if the forecasts are bad, leading to heavy losses for the insurance company.

(h) Extending Insurance Coverage to All Regions and Most Crops: For political reasons, many government backed comprehensive agricultural insurance programs seek to extent "affordable" insurance to high-risk areas and to accept all clients regardless of management skills, character, and risk profile. This violates one of the Golden Rules—all risks are not insurable. Either the premiums should be set sufficiently high, active client screening engaged in, or the insurance company should withdraw.

(i)Using Third Party Claim Adjusters: The monitoring and claim inspections cannot be delegated to third parties or strategic allies. The staff of the insurance company underwriting the policy should make the physical inspection to verify and make claim adjustments. To use third parties creates the risk of collusion and fraudulent manipulation between the policyholder and the third party.

(j) Few restrictions as to who can be an insurance agent capable of selling insurance should apply, that is only an individual with specific training. Greater flexibility should be allowed for legal entities such as NGOs, cooperatives, farmer and community associations, and credit granting institutions to affiliate with a recognized insurance and serve as an indirect delivery platform. In the developing rural areas, indirect delivery mechanisms may be preferable to direct mechanisms in order to lower the fixed costs of establishing an extensive branching system.

(k) Adopt an Integrated Risk Management Strategy

A "layered risk management strategy" should be followed wherein a series of coordinated and reinforcing activities are pursued. The government, international reinsurance companies, national insurance companies, insurance supervisors, and farmers have to work together. The cornerstone of the strategy is an effective and improved agricultural extension service that helps farmers educates themselves about risk management and to take individual on-farm actions to reduce vulnerability and mitigate risks.

The government, however, should condition the level of assistance on demonstrated prudence and diligence-the adoption of good management practices, avoidance of excessive risk, and the use of formal financial instruments whenever feasible prior to the event.

5.6 CONCLUSION

Agricultural insurance can be very helpful in enhancing food security in Zimbabwe. A carefully structured and tailor made modernized crop insurance facility can enhance farmer productivity, improvement in risk management, better farming practices, peace of mind and also provides recourse in cases of agricultural calamities. However crop insurance on its own cannot be a panacea to the risks associated with farming. There is need for complements such as government funding (inputs supply and other incentives), research institutes (to provide statistics and better farming methods), meteorological centres (provision of accurate and real time weather forecasts), and financing institutions. It also requires cooperation, understanding, and discipline amongst the farmers. In a nutshell, crop insurance needs systems (holistic) approach rather than a fragmented approach for it to be successfully implemented

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APPENDIX 1 QUESTIONNAIRE

My name is Innocent Tinarwo (Undergraduate student – Bcom Risk Management and Insurance (NUST)), and i kindly request you to contribute to my research project by responding to the attached questionnaire. The research is in partial fulfillment of the requirements of the Bachelor of commerce (Hons) Risk Management and Insurance and is entitled '*The relevancy of crop insurance in enhancing food security in Zimbabwe'*. All information supplied shall be treated with strict confidentiality and shall be used for academic purposes only.

Please tick in the appropriate box

1. Type of company / business

☐ Subsistence Farm

☐ Small scale commercial farmer

☐ Large scale commercial farmer

☐ Other (Specify)……..

2. Occupation of Respondent

☐ Farm Manager

☐ Farm owner

☐ Accountant

☐ Other (Specify)……...

3. Age (Please tick in the appropriate box)

Age Class	
Below 25	
25 to 40	
Above 40	

4. In which region are you based (state the region, followed by area e.g. *Manicaland, Mutare*)……

5. Do you have a general understanding on the operations of crop insurance

☐ Yes ☐ No

6. In your opinion, which of the following mostly affect your incomes from farming? (Please rank the risks in descending order)

☐ Drought

☐ Excessive rainfall

☐ Poor Farming Methods and land use

☐ Soil infertility

☐ Poor timing due to changing seasons

☐ Government Policy

☐ Inadequate weather Predictions

☐ Price Fluctuations

7a) Do you have crop insurance?

☐ Yes ☐ No

b) If no above, may you briefly outline the procedures used to prevent the loss of agricultural output due to the following;

- Drought…….

…….

- Poor land use and

  management…….

……

- Catastrophic

  risk……

- Risk of predicting rainfall

  patterns…….

- Soil Infertility……

- Excessive

  rainfall……...……

c) If you have crop insurance, does it cover the following risks?

Risks	**Yes**	**No**
Climatic Risks (Hail, Frost, Drought, etc)		
Sanitary Risks (Plagues and Diseases)		
Man-made (War, Financial Crises)		
Yield / Production Risks(Variation in crop yields over seasons)		
Price Risk (the risk of falling or rising prices of outputs and / or inputs)		
Financial Risks (Credit worthiness, liquidity, solvency)		

8. What do you think are the main sources and drivers of the following risks in your company?

Risk	**SOURCES**			
Climatic Risk	Inadequate weather forecasting techniques	Natural Dissasters e.g. drought	Poor rainfall distribution	Other (Specify)
Sanitary Risk	Lack of funds to buy pesticides	Unavailability of pesticides	Pests have become immune to the available pesticides	Other (Specify)
Man Made Risk	Unavailability of Foreign currency to buy inputs	Social instability	High levels of stock theft	Other (Specify)
Yield Risk	High costs of inputs	Inadequate training in best farming methods like crop rotation	Soil infertility and / or poor farming methods like stream bank cultivation	Other (Specify)
Price Risk	Volatility in prices of agricultural products	Variations in crop yields resulting in variations in demand which affects price	Inadequate controls on output prices e.g. where there are government controls in pricing	Other (Specify)
Financial Risk	Inadequate assets to use as collateral when applying for loans	Firm not investing its income profitably	The income generated is not enough to obtain high investment returns	Other (Specify)

9. Does your company use approved standard farming methods?

☐ Yes ☐ No

10. Does your company have a research and development department which looks for new and efficient farming methods?

☐ Yes ☐ No

11. What was generally the crop yield before and after purchasing crop insurance for the past 5 years? (If you do not have crop insurance, you may fill the column labeled "before" only)

Rating	**Before**	**After**
Poor		
Average		
Above Average		
Exceptionally Good		

9. What is the company's estimated annual income from crop farming operations?

Income	
Less than Z$500 billion	
Z$500 billion to Z$1 trillion	
Above Z$1 trillion	

8. In your own opinion, do you think a comprehensive crop insurance programme can enhance your agricultural productivity?

☐ Yes ☐ No

……

I wish to extend my heartfelt gratitude to you, for having spared your time to make my research project a success. Once again I thank you.

……END……..