

ASSESSING THE ROLE OF WEATHER INDEX INSURANCE IN CLIMATE CHANGE
ADAPTATION IN MALAWI

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Declaration

Minor dissertation presented for the approval of Senate in partial fulfilment of the requirements for the Master of Science degree specializing in Climate Change and Sustainable Development in approved courses and a minor dissertation. I hereby declare that I have read and understood the regulations governing the submission of MSc dissertation specialising in Climate Change and Sustainable Development, including those relating length and plagiarism, as contained in the rules of the university, and that this minor dissertation conforms to those regulations.

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Abstract

Climate change is one of the most challenging problems of the 21st century. Its effects have already been experienced in the different parts of the world. Farmers face particularly high risks considering that their occupation is climate dependent. Therefore farmers have been implementing different adaptation activities in an effort to reduce the impacts of climate change on their livelihoods. Weather index insurance (WII) has been recommended as one potential climate change adaptation strategy. In Malawi WII was introduced and piloted in 2005 to help farmers get access to loans. In this study the implementation of WII in Malawi is assessed to examine whether it has any role to play in climate change adaptation. Focus group discussions involving 15 farmers, and individual interviews involving two state and five non-state actors who were involved in implementing WII, were conducted. Perceptions and understandings of weather index insurance as a climate change adaptation strategy were examined, and the roles of state and non-state actors were established. The potential for weather index insurance as a means for securing finance for investment into climate resilient crops was also investigated. The study reveals that the design of WII affects how farmers perceive and understand it. In general, farmers see WII as a means for securing loans and not a potential climate change adaptation tool. The study also found that most implementing organisations did not take up the role of promoting awareness about WII and this may have affected the uptake of WII by farmers and organisations that are implementing climate change adaptation projects. The study finds that farmers do not get cash payments when there is a loss event and farmers are not able to choose how the payout must be used. Furthermore, most of the study participants did not have knowledge about climate finance despite its increasing attention at the international level. This study can inform the design of WII so that it can be better implemented as a climate change adaptation tool in Malawi.

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List of Acronyms

AGRA	Alliance for a Green Revolution in Africa
AIDS	Acquired Immune Deficiency Syndrome
ASWAP	Agricultural Sector Wide Approach
AWS	Automated Weather Stations
CRMG	Commodity Risk Management Group
GHG	Green House Gas
GOM	Government of Malawi
IFAD	International Fund for Agricultural Development
IPPC	Intergovernmental Panel for Climate Change
IRI	International Research Institute for Climate and Society
MGDS	Malawi Growth Development Strategy
NSO	National Statistics Office
UNFCCC	United Nations Framework Convention for Climate Change
WII	Weather Index Insurance

Chapter 1: Introduction

1.1 Introduction to the Study

“Farming production relies heavily on the weather by its nature and is subject to periodic drought and flood at certain intervals. Climate change could aggravate the frequency and scale of weather-related crop damage, and thus likely to lead to a vicious circle: A drop in the recovery of farming output wreaking havoc on the economy of farming villages, triggering the collapse of farming communities and causing an exodus of farmers into urban areas, consequently leading to a further decline in farming output” (Hongo, 2010: 3).

A variable and unpredictable climate is associated with risks that leave poor people vulnerable, thereby affecting livelihoods and hindering their development. The risks can result directly from weather shocks (Hellmuth *et al.*, 2009). A shock is defined as “*a realization of the state of the world whose risk may or may not have been recognized beforehand*” (Dercon, 2010:16). Not recognising the risk beforehand makes it an unanticipated event with positive or negative implications (Rakib and Matz, 2014: 3). Here, weather shocks are defined as those that are caused by extreme weather events. Extreme weather events happen when the value of a weather or climate variable occurs below or above the threshold value (IPPC, 2012.).

According to Collier *et al.* (2009: 102) climate change adaptation is intrinsically tied to development issues in lower income countries. Many of the least developed countries, which have economies largely dependent on agriculture, limited social safety nets and very little risk mitigation infrastructure, are the most vulnerable countries to climate change (Stern, 2007). Likewise, the poor, who often live and work on marginal lands, engage in unskilled labour,

and have very limited access to capital, are the most vulnerable populations to climate change. Poor households face the risk of being trapped in chronic poverty due to weather shocks (Barnett *et al.*, 2008).

1.2 Problem statement

Most of the productive sectors that support Malawi's economy are dependent on climate Government of Malawi (GoM, 2011: 2) These include agriculture, forestry, parks and wildlife, fisheries, energy and the tourism industry. This means that climate is one of the key determining factors in the national development goals of reducing poverty, economic growth and food security. This calls for a responsive action in the management of climate related risks so that there is no interference with the achievement of national development goals (ibid). According to the Intergovernmental Panel on Climate Change (IPCC, 2014), climate change is already happening as evidenced by impacts such as rising temperatures and changes in rainfall patterns that are being experienced at a global scale.

According to GoM (2011: 2) Malawi has already been seriously affected by the impacts of climate change. Firstly, experiences in rainfall variability thus food production has been affected since the weather is uncertain. Secondly, the frequency of occurrence of floods has increased with areas located along the lake and the main river Shire being the most affected. Thirdly, strong winds and landslides have also been experienced in some parts of the country due to prolonged torrential rains. These events have led to loss of lives, destruction of property and livelihoods (ibid). According to Davies *et al.* (2009) climate change will increase the frequency, intensity and magnitude of these weather-related events. Since Malawi largely depends on rain-fed agriculture, it is likely that the effects of droughts and floods will continue to affect agricultural productivity. When this happens, farmers will

continue to experience crop failure which leads to food shortages, hunger and malnutrition (Environmental Affairs Department, 2006).

Insurance instruments provide an opportunity for people in developing countries to secure their economies from the effects of extreme weather events (Suarez and Linnerooth-Bayer, 2010). Weather index insurance (WII) (defined in section 2.2) is a relatively new form of insurance aimed at people living in lower income communities and can be used to address weather and climate risks. According to Daron and Stainforth (2014) insurance mechanisms such as WII have received support as potential tools for climate change adaptation. Kapondamgaga (2011) conducted a study on weather index insurance, the study mainly focused on the demand and how profitable WII is among Tobacco farmers in central Malawi, the study did not look into climate change as it relates to WII which is the main focus of this study.

1.3 Study Aim and Objectives

1.3.1. Aim

To assess the role of WII in climate change adaptation in Malawi.

1.3.2 Specific Objectives.

1. To determine the willingness to participate in weather index insurance by farmers and understand perceptions of the study participants towards weather index insurance as a means for reducing risks associated with climate variability and change.
2. To understand the role of state and non-state actors in the implementation of weather based index insurance.
3. To determine the major uses of insurance pay-outs by insured farmers.

4. To identify the challenges faced by state and non-state actors in the implementation of weather index insurance.
5. To understand the role of WII in securing finance for investment in climate resilient crops.

1.4 Relevance of the Study

WII has been implemented in Malawi mainly as a means for farmers to earn credit for farm inputs and insure their crops against risk but has not received a great deal of attention as having a role in climate change adaptation. However, Bals *et al.* (2006) and Schwank *et al.* (2010) indicate that insurance-related instruments received attention because of the belief that they could play a role in the implementation of climate-change adaptation, with special attention towards the most affected areas considered to have the least ability to absorb the negative effects of extreme weather events. Therefore, this study was conducted to assess if the implementation of WII has a role to play in climate change adaptation in Malawi. This was done by determining the farmer's willingness to participate in WII while understanding their perceptions and those of the implementing stakeholders towards WII having a role as a climate change adaptation strategy. The study specifically focused on how they perceive WII as a means for reducing risks associated with climate variability and change.

The study further assesses the roles played by different state and non-state actors who are stakeholders in the implementation of weather index insurance. It is hoped that the findings from this study will help inform policy makers understand the potential of WII in climate change adaptation so that it can be considered as a policy issue. This will contribute to the debate on how, and if, to scale up the adoption of WII in Malawi and it will also inform relevant state and non-state actors, especially those who are doing work on climate change to

consider its implementation. Lastly, it will raise awareness on the role of WII in the portfolio of climate change adaptation responses in Malawi.

The structure of the thesis is as follows. Section 2 provides the background and rationale of the study; section 3 provides a review of the literature; section 4 provides the methodology, section 5 documents the results; section 6 discusses the results in the context of the study objectives; and finally, section 7 concludes the study.

Chapter 2: Background and Rationale of the Study

This section provides background information about Malawi, a brief overview of weather index insurance, the pilot study that was conducted by the World Bank and the lessons learnt.

2.1 Background to Malawi



Figure 1 Map of Africa showing the location of Malawi (Source: ExperienceMalawi)

According to Suarez *et al.*, (2008:5), Malawi is categorised as one of the Southern African region countries where food insecurity is high. Figure 1 (ExperienceMalawi, n.d.) shows the location of Malawi in Africa. The country is highly vulnerable due to the fact that the land holding size for farmers is small (ranging from 0.5 to 3 hectares), soil fertility has declined and it has been severely affected by the AIDS pandemic. The census data from 2008 (the most recent population and housing census exercise in Malawi) indicated a population growth rate of 2.7% and an estimated population of 13 million people (National Statistics Office of

Malawi (NSO, 2011). 85% of the Malawian population lives in the rural areas and the majority of whom (about 80%) engage in agricultural activities (NSO, 2011). Malawian farmers grow maize, which is the main food crop, and also groundnut and tobacco as the main cash crops (Osgood and Warren, 2007).

A report by Action Aid (2006) reveals that many rural farmers remain poor and vulnerable because of recurrent droughts and floods that result in widespread food insecurity. However, according to Bryla and Syroka (2009) it is uncommon for Malawi to experience major national droughts; rather it was indicated that regional droughts occur in specific parts of the country. In 2004/05, about 40 % of smallholder farmers had to rely on food aid when a serious drought occurred (ibid). Despite good rains in the season 2005/06, some farmers did not get the most out of their farming activities due to shortages in rainfall (ibid). 2006/07 was a good season for Malawi because much of the country received favorable rainfall thus recorded bumper yields in most parts of the country (ibid). Despite this, a number of areas were still affected by drought while others experienced flooding. This indicates that rainfall risk is endemic, and must be factored into the costs of doing business, including the costs of providing agricultural credit (ibid). It has been determined that those areas that are the most affected by the negative effects of extreme weather events (e.g. droughts and floods) would have the least ability to absorb the impacts (Bals *et al.*, 2006). Insurance-related instruments received attention because of the belief that they could play a role in the implementation of climate-change adaptation (Bryla and Syroka, 2009). WII is one such insurance instrument.

2.2 An Overview of Weather Index Insurance

“Weather index insurance is an innovative form of index insurance that covers farmers against weather-related extreme events. It utilizes a proxy (or index) such as amount of rainfall, or temperature, or wind speed to trigger indemnity payouts to farmers. This index helps to determine whether farmers have suffered losses from the insured peril and hence need to be compensated” (AGRA, 2014:97).

To date, WII has been applied against rainfall deficits (i.e. droughts) based on rainfall measurements at a reference weather station (or stations) during a defined period of time. Insurance payouts are made based on a pre-established indemnity scale set out in the insurance policy. When the actual rainfall in the cropping season falls below a pre-defined threshold level, payments are made. One significant challenge presented with this type of insurance is that of basis risk whereby what the farmers experience differs from what the index predicts (AGRA, 2014). According to Collier *et al.* (2009) this risk cannot be completely eliminated but it can be reduced by designing the contract carefully. Because of basis risk, WII programs are typically limited to areas with relatively simple topography and where historical weather data records are readily available. Therefore, clients are identified depending on their proximity to a meteorological station or where there is reliable weather data.

According to Osgood *et al.* (2007) there are stages that are followed in the design of WII. The first stage involves the identification of an implementation site, and for a particular region to be chosen as an implementation site there has to be historical data available and a high probability of being affected by El Nino events. The second stage involves developing additional partnerships with insurers, re-insurers, farmers’ organizations, government

agencies, banks and other groups, depending on the nature of the project. At this point, contracts are developed by agricultural economists and other researchers in consultation with agronomists, climate scientists and insurers. The complexity of design has also necessitated a multi-disciplinary approach to developing the contracts. Insurers, charged with redistributing risks, require a well-designed contract with well-parameterized risks. In many cases, a lack of rainfall data from local meteorological stations has led to using satellite generated data about rainfall to create more robust contracts. The next stage involves selecting the farming areas to be covered by the program, usually through consultation with a farmer support agency. The participation of this kind of organization is important for developing the index insurance, because it makes farmer access and information dissemination about the program easy.

“Finally, farmers themselves are consulted in workshops and focus groups to determine the crops, risks and growing calendars. Some data about farmer income and willingness to participate in insurance may also be collected at this time. This information, along with climate and yield data, is then used to design a contract that balances protection against climate extremes with pricing concerns. The contract details can vary based on the local situation and can include links to other forms of microfinance.” (Peterson, 2012:566)

2.3 Weather Index Insurance Pilot in Malawi

AWII scheme was piloted during the 2005-06 crop season in four areas of central Malawi; namely Nkhotakota, Kasungu, Lilongwe and Chitedze. It was coordinated by the Commodity Risk Management Group (CRMG) belonging to the World Bank, and involved local stakeholders. The scheme was implemented with assistance from the International Research Institute for Climate and Society (IRI). The pilot project was implemented for the purpose of creating opportunities for groundnut farmers to be able to access credit while managing

drought risks (Hess and Syroka, 2005) as quoted by (Linnerooth-Bayer and Mechler, 2007). Insurance contracts were coupled with loans in order to address issues associated with the risk of deficit rainfall (i.e. drought) during the growing season. At the beginning of the crop season, November 2005, 982 smallholder farmers bought the weather insurance, this comprised an insurance contract and a loan for hybrid groundnut seed. These farmers belonged to farmer clubs of 10-20 members each; the insurance allowed their respective clubs to access the loan package for hybrid groundnut seed (Linnerooth-Bayer and Mechler, 2007)

A study by Osgood and Warren (2006), reports that stakeholders showed willingness to participate in the new concept and were enthusiastic about it because it had a great deal of potential. Groundnut was chosen as the crop fit for piloting the insurance scheme due to its sensitivity to drought, and the fact that it does not require inputs like fertilizer. It also had an organised marketing system and was designed to generate enough profit to allow farmers to pay back their loans and retain surplus.

Bryla and Syroka (2009) summarised the lessons drawn from the pilot study which they stated as critical for future work on WII to be sustainable. The first lesson was that WII is only one tool to mitigate the risks of agricultural finance and supply chain relationships because it focuses on only one or two aspects of production risk. It was therefore suggested that a range of risk reducing or mitigating measures (technology, agronomic practices, crop storage, etc.) be implemented so that insurance can be a supplement by supporting recovery when other measures fail. Secondly, the pilot unveiled the need for increased investment in meteorological services in order to expand the potential market for index based insurance as this would allow for increased farmer participation and also reduce basis risk. The third

lesson was the need for the insurance sector in Malawi to take a larger role in contract design and underwriting. This includes improvements in the areas of risk analysis, crop modelling and contract design, if the program is to become a sustained initiative. It was also revealed that expanding the program would allow the local insurance industry to grow larger and develop a more diversified portfolio of risk. This would require further training for the Insurance Association of Malawi so that individual companies can take more direct responsibility for the insurance product and portfolio management; this was suggested because during the pilot work nine insurance companies had worked together to underwrite the risk from the program.

In 2011, the Malawi government adopted the agricultural sector wide approach (ASWAP), a strategy to support priority activities in the agricultural sector. The main aims of the ASWAP are to increase agricultural productivity so that Malawi is made a “hunger free” nation. The ASWAP document highlighted that they would “*develop a weather insurance product for Maize (Malawi’s staple crop)*”and that they would “*promote innovative market based risk management schemes such as crop weather related insurance products.*”(GoM 2010:58) This indicates a positive step to the recognition of WII as a policy issue.

Chapter 3: Literature Review

3.1 Introduction

This section provides a general overview of climate change and climate change adaptation as one of the major responses to climate variability and change. It also provides a review of climate change adaptation as it relates to insurance, WII in Malawi and other relevant studies on WII as a climate change adaptation tool.

3.2 An Overview of Climate Change

The Intergovernmental Panel on Climate Change (IPCC 2014: 5) defines climate change as *“a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods”*.

Orindi and Murray (2005:3) reported climate change as *“one of the most significant challenges facing human society in the 21st century”*. They also reported that the increase in the amount of greenhouse gases in the atmosphere due to industrialisation is the major cause of the changes in the temperature and weather systems. For instance, The IPCC (2012:6) reported that *“there has been an overall decrease in the number of cold days and nights, and an overall increase in the number of warm days and nights, at the global scale.* (Orindi and Murray, 2005) reported how these changes will impact the human systems by affecting important sectors such as agriculture, water resources, human health and industry. According to Mertz *et al.* (2009), the impacts of climate change will be different around the globe because of the variations in the ability to adapt and also depending on how vulnerable a region or nation is. For instance, Orindi and Murray (2005) pointed out how poor communities live in high risk areas and lack the necessary economic and social resources

they need to adapt to climate change and how this renders them more vulnerable despite being the least contributors to GHG emissions globally. Boko *et al.* (2007) specifically mentioned sub-Saharan Africa as being highly vulnerable not only to climate change but other stressors.

3.3 Climate Change Adaptation and Insurance

Kartha *et al.* (2006) reported that adaptation emerges as one of the two main responses to the risks associated with climate change in addition to the reduction of greenhouse gas emissions. They also noted the responsibility that the industrialised countries have in bearing the costs of adapting to climate change for developing countries. The IPCC defines climate change adaptation as “*the process of adjusting to actual or expected climate and its effects in human systems*” (IPCC, 2014: 5). According to the IPCC (2014) Adaptation is a way of reducing or completely warding off harm or exploitation of beneficial opportunities. The IPCC (2014) reported that there is no single appropriate approach for risk reduction across different settings, implying that adaptation is happens depending on the context and the place. This is due to the fact that different regions have different degrees of vulnerability and exposure to risks. They recommend the reduction of vulnerability and exposure as the first step towards adaptation to future climate change

According to IPCC (2014), people have always implemented adaptation activities aimed at reducing the effects of climate change and variability. This has been done at different levels of success. The IPCC reports how it has been projected that climate change will increase the intensity of climate related risks and also create new ones. These will have negative and to a lesser extent positive effects on human and natural systems depending on the sector or region. For instance in the water resources sector, it has been projected that the frequency of drought occurrence in regions that are presently dry will increase. On the other hand, water resources are projected to increase for high latitude areas.

Zinyengere *et al.* (2013) report that climate change impacts will negatively affect crop production in Southern Africa. They reported how projections indicate an average decline of 18% for maize, a crop that is mostly grown for food among smallholder farming communities implying possible food insecurity in the region.

Hassan and Nhemachena (2007) reported that smallholder farmers represent 85% of the farmers in the world, half of which were estimated to be food insecure with 75% of the population having malnutrition. They therefore, recommended an analysis of adaptation options and constraints to adaptation, indicating that it is important for agricultural communities of Southern Africa.

Articles 4.8 of the United Nations Framework Convention for Climate Change (UNFCCC) and 3.14 of the Kyoto Protocol, together with the Bali action plan, stipulated proposed actions to meet the specific needs and concerns of developing countries in climate change adaptation, including insurance (Warner *et al.*, 2009). The IPCC, (2007) pointed out that the high exposure of many developing countries to climate risk would exacerbate the impacts of disaster shocks on development because most of these countries are not resilient enough to replace or repair the damage caused by major disasters. It was also mentioned by the IPCC that the risks are a barrier to the achievement of sustainable development. They therefore stressed the need to attend to the risks and proposed the investment into disaster risk reduction as the first step towards adaptation.

According to Schwank *et al.* (2010), insurance can be a systematic approach to adaptation, and can have a key role in the mitigation of risks associated with climate change. They further stated that insurance can assist in the better management of climate risks such as

extreme weather events, especially for countries that are highly vulnerable. WII should not be seen as a replacement or a way to avoid other climate change adaptation strategies that have been developed and are being implemented by the communities. Rather it should be there to support their implementation (IFAD, 2011)

According to Linnerooth-Bayer & Mechler (2006) the emergence of insurance instruments would help to address the problems of food insecurity. By acquiring insurance, farm households will not only have access to post-disaster liquidity which would in turn help them avoid famine and have secure livelihoods, but also improve their credit worthiness thus enabling them to engage in higher-return crop practices.

According to Hellmuth *et al.* (2007), farmers that are not insured sell some of their valued assets, such as equipment and livestock, which they may want to keep but cannot as they are constrained by the drought and the need to survive. This means that their dependency on aid increases. Thus the money takes them through the drought period until the next farming season starts when they can resume their farming activities (*ibid*). This implies that insurance reduces the dependency on donor support in case of emergencies. Insurance also give farmers the ability and confidence to take risks in order to increase their returns; such risks would include investments in fertilizers and improved seeds. Disadvantages of drought insurance emerge when the crop fails due to reasons other than rainfall deficit or drought, since this is only what the insurance covers. In the case of a pest or disease outbreak, for instance, a farmer would receive no compensation. The other drawback with index-based insurance is its inability to protect the portion of smallholder farmers that are so poor to be economically active and have no land at all, or if they have then it is marginalised, implying that

governments would still have to rely on donor support in case of emergency relief and safety nets to protect these people (ibid).

3.3.1 Levels of Weather index insurance

IFAD (2011) discussed the levels at which WII can be introduced. The first level is the micro level i.e. where farmers purchase insurance to shield themselves against potential losses that would result from the occurrence of an adverse weather event. According to IFAD, insurance policies at this level can also be distributed by organisations such as farmers' associations, input suppliers, processors or Non-Governmental Organisations. These are referred to as intermediaries who are considered as having a closer contact with the farmers, who are the target group, than the insurers. They also have interests in protecting themselves and their smallholder clients against weather risk.

The second level is the meso level, where organizations can act as the policy holder. At this level, the structure of WII is through a policy issued to the organization, but with pay out processes that can benefit farmers directly or indirectly. Finally, the macro level is where WII can be sold to aid governments and relief agencies working in development and disaster management (IFAD, 2011). For instance, In 2008/2009 crop growing season the Government of Malawi, with assistance from the World Bank, implemented a pilot project at Macro level where an instrument known as an index- based drought derivative contract was designed to help the government manage risks that would result from the impacts of droughts .It was recommended that several pilots be conducted in order for the scope and limitations of the contract to be well understood. Syroka and Nucifora (2010). According to IFAD (2011), this level involves exploring how WII can be integrated with other risk management policies that already exist. There has been an increased interest in WII being a potential agricultural adaptation strategy as climate change becomes urgent in the development agenda (Hellmuth

et al., 2009). There are changes in the average climate conditions expected to arise from climate change and adapting to these changes will have to be built on actions that increase resilience and reduce risk (*e.g.* appropriate crop varieties and cropping patterns; irrigation; and soil and farm management techniques). Even though actions are taken, risks remain or will increase (particularly due to extreme weather events) (IFAD, 2011).

Sandmark *et al.* (2013) reports that basis risk (defined in section 2), brings about questions on the real value of WII products because individuals may not lose anything to a weather shock but get payouts while those who lose their property may not get any payouts. Farmer behaviour (*e.g.* planting date) is very difficult to capture in an index based product designed prior to the beginning of the season and creates another limitation of index based insurance. This may mean that the WII contract is sensitive to rainfall during the wrong periods – *i.e.* not the period in which the farmer is planting their crop(s).

3.3.2 Suggested Conditions for Commercialising Weather Index Insurance

Hongo (2010) discusses the possibility of WII for agriculture to be commercialised and describes conditions that would have to be met in order to do enable this. Firstly, it was suggested that people should be made aware that the insurance is available. They noted that people in developing countries, especially in rural areas, often do not know anything about WII and are not properly informed about insurance itself. Farmers' understanding of the insurance package, including its benefits and costs, is key to its successful implementation. They also indicated the need for insurers to engage in information dissemination campaigns thereby ensuring that there is a certain market volume for the product before being marketed (Hongo, 2010).

The second condition discussed by Hongo (2010) is that the product should have appropriate premiums and payments against losses, whereby farmers would have knowledge of the

expected payment for a certain level of premium. The expectations of the farmers may be different because they would depend on their individual situations (e.g. income levels and location) and the crop they grow; therefore continued follow ups on the needs of the policyholders would be essential.

Thirdly, the likelihood of an insurance payment is an important condition for the insurance to be sustainable. If payouts are not made for a long time, farmers may withdraw their participation (Hongo, 2010). If farmers receive payouts often, this will increase their understanding that insurance can indeed be useful. The fourth condition is that the farmers must work with locally based partners to build farmers' trust. WII is a product that farmers are not familiar with, and as such they would not invest in insurance if the people selling it are not well known locally.

Another condition is the need to recognise the importance of coordination because the development of insurance products requires the availability of a range of data, for instance, on weather and weather-related agricultural production. Often this data can be insufficient in developing countries. Furthermore, the private sector (who are the product developers) may have limited access to the data because different government departments are usually the ones in charge of the data. Proper coordination will ensure that the private sector and government departments are working together, and this will also ease the sale of insurance products by the developers to the farmers since they will be linked to the local networks, thereby developing trust. The last condition recognises the need to secure finances so that the capacity for the insurance companies to afford payments against claims is increased; this would happen when agricultural insurance scales up (Hongo, 2010).

Collier *et al.* (2009) summarised the points that qualify WII as an adaptation measure. The first point was that WII can contribute to increased resilience and adaptive capacity of the insured households. Their argument was that WII is designed in such a way that protects households from catastrophic weather events, and that climate change impacts will increase the occurrence of such weather events thus making WII a shield for the households. Secondly, insurance has used price signals in the reduction of vulnerability for a long time. In the case of WII, its price can influence households' behavioral change including how and what to change. Thirdly, the provision of cash through insurance payouts provides households with the financial means to adapt. Following a catastrophic event, households may want to continue living their lives as before or change their way of living as adaptation strategies; the former may require restocking of assets while the latter may require capital to invest. Financial constraints can hinder adaptation for most low income populations, thus cash payments from insurance provides an opportunity for farmers to adopt adaptation strategies. Lastly, WII can be bundled with new technologies, such as drought resistant seeds, thereby encouraging adaptation. The benefits for this approach are twofold as the households can access the seed and also have their crop insured. This was the case with the Malawi program whereby WII was bundled with loans for farmers.

3.3.3 Impacts of Weather Index Insurance

Carter *et al.* (2014) conducted a review on the impacts of index insurance where it has been implemented before. The main focus was to see how index insurance influence the decisions of those who purchase it the either before (*ex-ante*) or after (*ex-post*) experiencing an extreme event. According to Janzen and Carter (2013), farmers in Northern Kenya who insure their livestock against drought reduce asset smoothing and consumption smoothing; two key dimensions of self-insurance. Asset smoothing and consumption smoothing are steps that households take to cope with risks before and after the occurrence of a shock respectively

(Murdoch, 1995:104). Janzen and Carter (2013) indicated that insured households depend less on food aid and other forms of assistance after they have experienced an extreme event, indicating that they are able to cope with shocks.

On *ex-ante* impacts, the review by Carter *et al.* (2014) concluded that insurance motivates farmers to invest in activities that are highly profitable, yet of higher risk. A study conducted by Karlan *et al.* (2012) revealed that a lack of access to insurance for maize farmers in Ghana limits their ability to invest in agriculture. They found that farmers who purchased rainfall index insurance increased their ability to invest in agricultural activities by 13 %. One other important thing they found out, which is a rare case, was the fact that farmers maintained their strong demand for insurance even when insurers charge full price for the insurance products. They also pointed out that farmers' experiences of payouts are important for demand.

Despite the positive impacts that index based insurance has had where it has been implemented, there is still slow uptake. Carter *et al.* (2014) provided reasons for slow uptake and stated that they need to be addressed if uptake of index based insurance is to improve. The first reason is the quality of the insurance product, as related to basis risk, whereby farmers will purchase an insurance product if it correlates well to the yield of the crop especially if the crop is one of the major sources of income for them. The second determinant of uptake was the design of the contract for the insurance product where they stated that a contract has to be well designed in order to attract more demand. In the case of a rainfall index, a well-designed contract will take into account how rainfall is distributed in all the stages of crop growth.

The third reason is the availability of other insurance mechanisms whereby if a shock occurs and WII proves to be a lesser coping strategy than other means of coping, farmers will prefer the other coping means. The fourth reason is the packaging of the insurance, for instance, where farmers are less likely to purchase WII if it is not combined with credit. This means that there has to be something attractive about the insurance package for the farmers to want to purchase it. In addition, if the insurance product is combined with a loan, it will attract the farmers more if the repayment terms are flexible. Demand will also be high if the premium prices are changed to fit the farmers' current situation. For instance, premiums can be collected at a time when the farmers have the ability to pay *e.g.* when they have just sold their farm produce (Hellmuth *et al.*, 2009).

The fifth reason for slow uptake is the lack of knowledge of the insurance product and lack of trust for the insurance providers by the farmers. Since it is not easy to know how much the payout will be in index insurance because of lack of precise knowledge of the relationship between weather and loss, the expectations of the farmer is that the provider, who may be better informed on risks, will set fair prices (Carter, 2014). According to Hellmuth *et al.* (2009), this helps the farmers to place trust in the insurers. The sixth reason outlined by Carter *et al.* (2014) is that of learning from stochastic experiences whereby recent experiences play a role in conditioning how farmers perceive things. So if a certain shock is uncovered in an insurance product, farmers will become aware of it and it will affect demand for that insurance product. The last reason is the cost and price of index insurance whereby the product has low implementation costs but is priced high thus negatively affecting the demand of the product and consequently its take up.

3.3.4 Common Challenges of Weather Index Insurance in Developing Countries

Hossain (2013) summarised the challenges of WII that are common to developing countries. The first challenge is that of product familiarity and education. It is a challenge particularly when the target audiences are smallholder farmers who have no previous knowledge about insurance. Skees (2008a) reported the need to ensure that insurers, government regulators or policy makers acquire some knowledge on how the product manages risk, and also how it facilitates and regulates markets. This will improve the insurers' ability to market the product (Manuamorn, 2005).

The second challenge is the ability of local insurers to finance large losses. The financial capacity of local micro-insurance companies may not be sufficient to payout all claims in cases where losses occur on a large scale. This is where the insurance company may need the support of the government, international donors or larger insurers and reinsurers (Skees, 2008a).

Collier *et al.*, (2009) and Daron and Stainforth (2014) indicate that the uncertainty associated with the impact of future climate trends is a primary difficulty with the development of WII. This uncertainty contributes to the insurance charges being ambiguous and therefore potentially unsustainable in the long run. The development of WII also incurs high costs thereby reducing the willingness of insurers to develop it because it would mean high business risk especially in regions where insurance is not widely used.

According to Patt et al (2009) high administrative costs, insufficient distribution channels, a lack of suitable actuarial data, an increasingly regulated operating environment, cultural and religious values and a lack of trust in financial and insurance systems are some of the challenges associated with weather index insurance.

3.4 Climate Change and Weather Index Insurance in Malawi

In Malawi, agriculture is one of the most important sectors of the economy and contributes approximately 33% of the country's gross domestic product and 80% of national employment, with 90 % of the labour force resident in rural areas. The sector largely depends on rainfall and this renders it vulnerable to the effects of climate variability and change (NSO, 2009). According to the Government of Malawi (2010), vulnerability and adaptation assessment exercises that were conducted in 2001, 2002 and 2010 revealed that Malawi is experiencing a variety of climatic hazards including seasonal droughts, cold spells, intense rainfall, dry spells, strong winds, thunderstorms, landslides, hailstorms, mudslides, floods and heat waves. The country is particularly prone to flood and drought events which appear to have increased in recent decades. Figure 2 (Action Aid, 2006) shows a trend of floods and droughts for Malawi from 1970 to 2006.

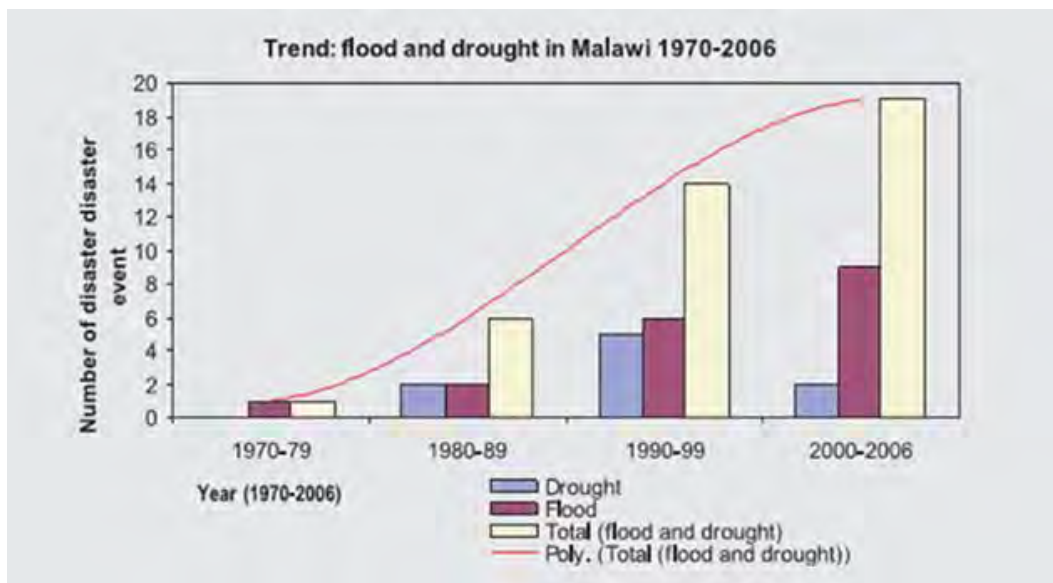


Figure 2 Flood and drought in Malawi, 1970-2006 (Source: Action Aid 2006)

Recent climate trends assessments show an increase in the mean annual temperature by 0.9 °C between 1960 and 2006, with an average rate of 0.21 °C per decade (Nkomwa *et al.*, 2013). According to McSweeney *et al.* (2008), there has been a significant decrease in the

frequency of cold days and nights since 1960 in all seasons. It is expected that the changes in climate will continue to negatively affect agricultural production, not only in Malawi but across the continent. This could result in widespread poverty and food insecurity with small scale farmers being more vulnerable (Easterling *et al.*, 2007)

3.5 Relevant climate change and index insurance studies

Deressa *et al.* (2008) conducted a study to analyse farmers' awareness of climate change. The results of the study indicated that most farmers who participated in the study were aware that temperatures had increased and precipitation levels had declined over the past 20 years. Patt *et al.* (2010) conducted a study to find out the extent of farmers' understanding of crop insurance as a means to reduce risks associated with climate variability. The study adopted a participatory learning experimental approach whereby simulation games and interactive education sessions were used as the methods. These methods were chosen because they aimed to provide a simplified message to aid the farmers' understanding of insurance concepts. Despite their efforts, it was found that farmers do not understand many of the core concepts of insurance that would necessitate their decision to participate in the implementation of weather index insurance. Patt *et al.* (2010) highlighted education as one of the factors that would contribute to their level of understanding of insurance and recommended additional training for lesser educated farmers in order to enhance their understanding. This is in agreement with Jafee *et al.* (2008) who stated that education is fundamental to the understanding of a product thereby positively affecting its uptake.

Jafee *et al.* (2008) also indicated how important it is to note that other factors play a role in determining farmers' decisions and their levels of participation in weather risk management programs. Patt *et al.* (2010) examined the relationship between the level of understanding of WII and their desire to purchase it. It was found that those farmers who had a better understanding of the insurance concepts preferred purchasing it as compared to those who

had difficulties in understanding it. According to Patt *et al.* (2009), helping farmers understand index insurance will help ensure that when a farmer purchases an insurance product, it makes sense to them and will respond to their specific needs. This is however challenging considering that farmers will purchase insurance if it meets their social and economic needs.

Chapter 4: Methodology

This section will introduce the site of the study, explain the research approach that was adopted and discuss why it was deemed as an appropriate approach. It also outlines the design and methods that were used, as well as how the data was analysed and handled. Finally it discusses the ethical issues that were observed.

4.1 Study Area

4.1.1 Location

The study was conducted in Lumbadzi, located in the northern part of Lilongwe (the capital city of Malawi, see Figure 3).



Figure 3 Map of central Malawi showing the location of Lumbadzi (Source: Weather-forecast.com)

This place was chosen because it is one of the areas where WII was piloted by World Bank and therefore a place where there is likely to be sources of information relevant to this study.

4.1.2 Weather and Climate

Lumbadzi has a warm and temperate climate with an average annual temperature of 19.6°C and an average annual rainfall of 856mm. The wettest month is January with an average precipitation of 233 mm and July is the driest month, receiving less than 1mm of rainfall on average. In November, the warmest month, it has an average temperature of 22.6°C (climate-data.org, n.d.) (See Figure 4).

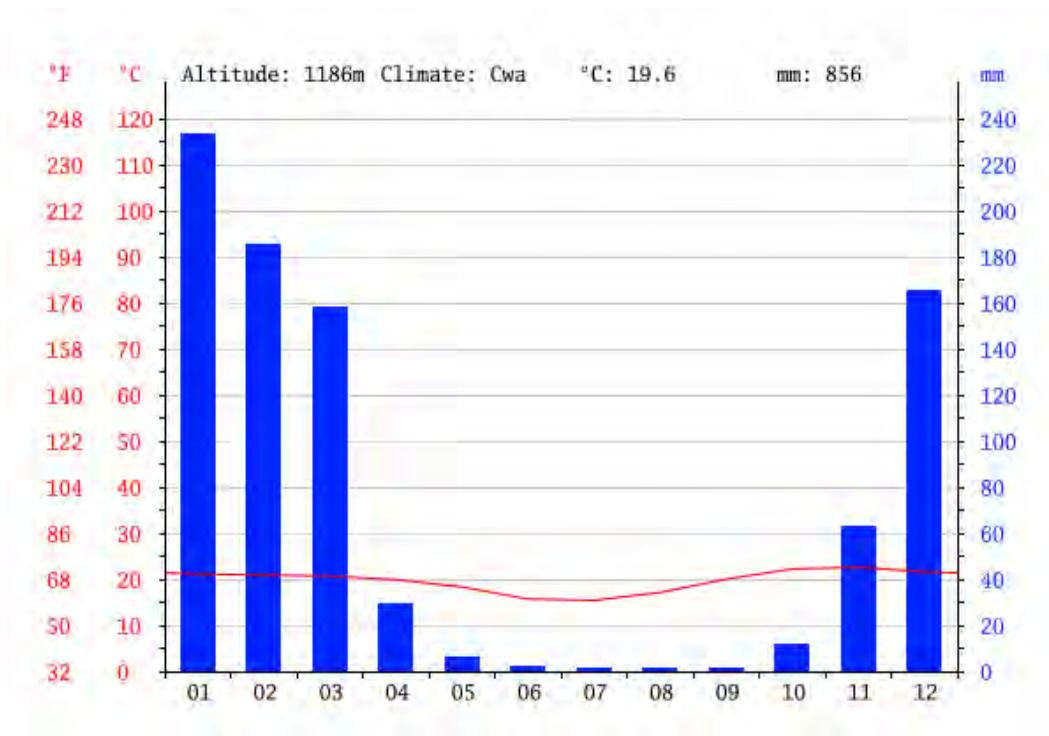


Figure 4 Lumbadzi climate graph showing monthly average temperature and precipitation (Source: Climate-data.org)

The X axis shows the months where one represents the month of January and 12 represents December. The Y axes show the temperature on the left side and precipitation on the right.

4.2 Approach

The study adopted a qualitative approach. According to Brikci and Green (2007:2) a qualitative research is characterised by its aims, which relate to understanding some aspect of social life, and its methods which (in general) generate words, rather than numbers, as data

for analysis. Elliot *et al.* (1999:216) also indicated that in this approach, the intention is to understand and represent the experiences and actions of people as they encounter, engage, and live through situations. They also explain that in this research approach the researcher also attempts to develop understanding of the phenomena under study, based on the perspective of those being studied. Therefore, due to the nature of the research question where most of the data generated would be non-numerical, it was decided that this was the right approach to be used in the study.

Participants for the study were chosen using purposeful and selective sampling. Morse (1991) defined purposeful (or theoretical) sampling as the type of sampling where the researcher selects a participant according to the needs of the study. Morse also defined selective sampling as “the type where the researcher makes a decision prior to beginning a study to interview informants with a broad general knowledge of the topic or those who have undergone experience and whose experience is considered typical”. This description of purposeful sampling indicates that the sampling is directed by a desire to explore the different perceptions that the participants have towards the subject of the study.

A total of 22 people were interviewed in the study, 15 of which were farmers. The 15 farmers were chosen on the basis that they had prior knowledge and had participated in the implementation of WII. These were the farmers that assembled at the venue for the discussions and were divided into two focus groups. It is worth mentioning that the farmers who participated in the study are exclusively small holder farmers and they grow crops like maize, tobacco, beans, soybean, groundnut and potatoes. State and non-state actors also participated in the study, the state actors refer to representatives of relevant government departments while non-state actors refer to those belonging to the private sector or non-

governmental organizations that played various roles in the implementation of WII pilot (see Table 2). Table 1 presents a breakdown of the study participants by audience and gender.

Table 1: Participants by audience and Gender

	Farmers	State actors	Non-state actors
Male Participants	9	2	5
Female participants	6	0	0
Total	15	2	5

The state and non-state actors had different roles in the implementation of weather index insurance. The table below shows the various roles played by each of them.

Table 2: State and Non-state actor roles and responsibilities in WII implementation

State actor 1	Facilitation of the processes
State actor 2	<ul style="list-style-type: none"> • Provision of meteorological data • responding to demand for WII by investing in weather infrastructure • maintaining a network of weather stations • conducting climate risk assessments, mapping and education awareness
Non-state actor 1	<ul style="list-style-type: none"> • Providing technical expertise for weather index insurance • conducting stakeholder and farmer awareness
Non-state actor 2	<ul style="list-style-type: none"> • reviewing the impact, relevance, sustainability and applicability of the index based insurance
Non-state actor 3	<ul style="list-style-type: none"> • Insurers of the product • Pay claims if they occur.
Non-state actor 4	<ul style="list-style-type: none"> • Implementing organisation

Non-state actor 5	<ul style="list-style-type: none"> • Providing members to participate, • Providing extension services, <p>supplying inputs,</p> <ul style="list-style-type: none"> • buying farmers' produce • tracking of loan repayments
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The state and non-state actors had different roles in the implementation of weather index insurance. As illustrated in table 5 according to the requirements of implementing WII, all the required roles had been covered.

4.3 Data Collection

A semi structured questionnaire was developed and used during the interviews. A semi structured interview contains questions that are repeated each time an interview is conducted and allows for some probing along the way if further information is required. However the direction of the interview is less constrained compared to those interviews that are structured (Richie and Lewis, 2011) and there will be differences in the nature of the questions and responses. According to Esterberg (2002:87) semi structured interviews are flexible as compared to structured interviews and the goal is to explore the topic more openly and to allow the interviewees to express their opinions and ideas in their own words thus allowing for a much freer exchange between interviewer and interviewee. According to Patton (1990), in this type of interview you want to understand a situation from another person's point of view by trying to recognize their ideas and experiences.

The questionnaire was divided into three main themes; it is worth noting that two or more objectives would fall under one theme. The first theme had questions that mainly targeted

farmers, while the last two themes targeted the state and non-state actors. During the study, focus group discussions with farmers and individual interviews with farmers, state and non-state actors were done in the data collection exercise and the same questionnaire was used for both the focus group discussions and the individual interviews. However, the questions that were used to interview the farmers were different from those used to interview the state and non-state actors because of different information needs from the two different groups; some questions were similar for comparison of the responses as it will be observed in the results. For instance, the farmers were asked to explain the changes in the climate of their area and the steps taken to reduce the effects of these changes. This question was not asked to the state and non-state actors because it was assumed they already had knowledge on climate change hence not deemed relevant for them. Instead, state and non-state actors were asked about WII being used to secure finance for investment in climate resilient crops and if they thought weather index insurance would be a policy issue.

It had been assumed that these questions would be very difficult for the farmers to understand and respond to and to ensure that farmers understood the contents of the questionnaire, it was translated into Chichewa, which is the national language and is spoken in every part of the country (refer to appendix 9.1 for the full questionnaire). The questionnaire was a guide for the interviews, and some responses prompted further probing to generate further relevant information. Creswell (2003) indicated that it is important to establish the validity of a research tool before it is administered. Therefore, the questionnaire was tested by being administered to a group of farmers who were not part of the study but were familiar with WII; this was done to find out if it would be able to generate the required information for the study.

4.4 Data Analysis

The data analysis and processing began by copying the data from the questionnaires into a Microsoft Word document. This document was then imported into software used for qualitative data analysis (NVivo version number 10). The software helps you easily organize and analyse unstructured information so that you can ultimately make better decisions (QSR International, 2014). The data was analysed by being grouped according to themes through a process called coding. According to QSR International (2014: 7) Coding is “*the process of gathering material by topic, theme or case*”. Some of the codes that were gathered during analysis of the data in this study were climate change knowledge, perceptions and understanding, knowledge about weather index insurance and participation. Some of the themes that were identified include understanding of climate change and WII, understanding state and non-state actor roles and examining knowledge about climate finance (refer to section 5).

4.5 Ethical Considerations

Since the study involved interviews with people, it is a requirement that ethical issues be considered. In this study necessary steps were taken to ensure that this is observed. A consent form was developed in this regard (see appendix 9.2). The consent form used for farmer interviews was translated into a language that they easily understood when it was read out to them. This was done to ensure that they were fully aware of the contents. The participants were required to sign the form to show that they had given their consent to participate after understanding it.

Chapter 5: Results

This section presents the findings of the study. The questions used in the study were grouped into three themes and the objectives of the study fall under these themes. The first theme was about the farmers' understanding of climate change and weather index insurance. The main focus for the farmers was their knowledge of climate change and their perceptions towards weather index insurance, what drove their willingness to participate in WII, the state and non-state actors' perceptions of how farmers understand WII and the ability of all the interviewees to explain the relationship between climate change. The questions under this theme targeted all the participants of the study (farmers, state and non-state actors) and mainly covered objectives 1 and 3.

The second theme was about understanding the role of state and non-state actors in implementing weather index insurance focusing on their views on whether WII should be an issue to be taken up by policy makers, the challenges they encountered in implementing WII and if there were any recommendations towards its improvement. This theme covered objectives 2 and 4

The last theme focused on examining the state and non-state actors' knowledge about climate finance, and specifically climate change adaptation finance. It was assumed that if WII can be used as a climate change adaptation tool, then it would qualify as a means to secure such funding for the purpose of investing in climate resilient crops. Therefore it was deemed necessary to find out from the state and non-state actors if they have knowledge of climate finance and if they thought WII would be used to acquire funding. This theme covered objective 5

5.1 Understanding and Perceptions of Climate Change and Weather Index Insurance

5.1.1. Farmers’ Understanding of Climate Variability and Change

In order to establish whether the farmers considered a link between climate change and weather index insurance, they were asked to identify any changes in the climate that interfered with their farming activities and what they had done to deal with those changes. Table 3 presents the changes, as identified by the farmers, and their solutions, as advised to them by the agricultural extension agent for the area.

Table 3: Signs of Climate Variability and Change and Measures taken

Climate change signs	Measures Taken
Change in Rainfall Patterns	<ul style="list-style-type: none"> • Planting earlier • Planting early maturing varieties
Increased experiences of intense heat	Planting trees for shade
Increased occurrences of drought and dry spells	No response

According to the farmers who participated in the study, the changes in rainfall patterns, droughts, dry spells and intense heat are clear evidence that there is climate change. The agricultural extension officer for the area advised them to be planting early, planting early maturing varieties and also planting trees for shade as some of the solutions. It was indicated that they do not have solutions for dry spells and droughts. This clearly shows that farmers are aware about climate variability and change.

5.1.2 Farmer’s Understanding and Perceptions of Weather Index Insurance

5.1.2.1 Farmers Perception on their Understanding

During the focus group discussions it emerged that WII had been introduced as a way of securing loans. The loans were not in form of cash but agricultural inputs that included seed and inorganic fertilizers. Therefore, farmers understood WII to be about securing loans. Further probing revealed that when WII was piloted in the area it was attached to a loan, this meant that any farmer who wanted to have access to the loan had to insure their crop with this insurance product.

5.1.2.2 .State and Non-state actors Perceptions on Farmer’s Understanding

The state and non-state actors were asked if they thought farmers understood weather index insurance. Some responses suggested that farmers understood what it was about while some of them stated that farmers do not understand what WII is. Table 4 shows some of the quotes in response to the question.

Table 4: Quotes on the responses of Stakeholders on their opinions on farmers' understanding of WII

	Quote
State actor 1	“I do not think farmers understand weather index insurance. All they are interested is to secure access to finance and inputs for improved production”
State actor 2	“Farmers do not understand the importance of insurance aside the loans”
Non-state actor 1	“They like it due to the benefits attached, just a few do take it for the loans. This means that their understanding of the product as a climate change adaptation shield is still low”
Non-state actor 2	“Progressive farmers will understand more than poor, illiterate

	subsistence farmers”
Non-state actor 3	“Insurance in general and not only weather insurance is not understood by many, i.e. Farmers and non- farmers. For weather insurance, farmers have no choice, as long as they get a bank loan then they have to buy this cover”
Non-state actor 4	“Farmers understand the general concept”

From the table it is clear that the stakeholders had different views on farmers understanding of WII. While Non-state actor 4 was of the view that farmers understand the general concept, the rest of the stakeholders had different opinions, some even went further to explain why they felt that farmers do not understand weather index insurance. For instance, non-state actor 2 brought in the issue of education. This shows that farmers are at different literacy levels and that those that have higher literacy levels are better likely to understand than those with low literacy levels.

Non-state actor 3 was of the view that, Insurance in general is not understood by a lot of people regardless of whether they are farmers or not. State actor 1, state actor 2 and non-state actor 1 mentioned the loans that form part of the insurance package as the only part that is understood by the farmers, they further explained that most farmers usually find it difficult to get loans from the banks because most of the farmers do not pay back the loans, therefore participating in WII provided an opportunity for them to access the loans. Non-state actor 1 went on to mention that since the only part of WII that attracted the farmers was the loan, they wouldn’t understand it as a shield against climate change impacts.

5.1.3 Linking Climate Change and Weather Index Insurance.

The understanding and perceptions of WII being a climate change adaptation option was established based on the participants' ability to explain the relationship between the two. The participants were both asked if they thought there is a link between climate change and WII and to explain their answer. Table 5 below shows the direct quotes from the participants' responses to the question.

Table 5 : Quotes of the responses on the link between Climate Change and WII

Participant	Quote
Farmer	“They are two different things therefore there is no link between the two, considering that climate change is something that is happening naturally while WII is something introduced by people.”
State actor 1	“WII and climate change are linked in that WII is an adaptation to climate change strategy. WII helps farmers and governments to adapt and thrive as the climate changes”
State actor 2	“Yes there is a link in the sense that climate change is the one that drives weather index insurance”
Non-state actor 1	“It is a climate change adaptation thing, especially in the sense that it is a proactive action for the farmers”
Non-state actor 2	<ul style="list-style-type: none"> • “Yes they are linked. It is the impacts of climate change that necessitates WII. • WII when properly designed reduces the impact of climate change on the farmers.”
Non-state actor 3	WII is a defense mechanism for climate change effects
Non-state actor 4	“There is a perception that adverse weather is on the rise and possibly better to insure”
Non-state actor 5	“Weather comes with risks that are climate change related, e.g.

drought and floods. WII can help shield against the risks.”

The study revealed that farmers do not know the link that exists between WII and climate change while the state and non-state actors were able to explain that they are linked and how (Table 5). Non-state actor 2 pointed out that if WII is properly designed then it would contribute to the reduction of climate change impacts. This suggests the need to pay attention to the design of WII if it is to help reduce the effects that climate change has on whoever will purchase the insurance product. From these results it is clear that farmers are aware that there is climate change but they cannot link it to weather index insurance.

5.1.4. Farmers’ Willingness to Participate in Weather Index Insurance

During the focus group discussions, farmers were asked if anyone made the decision for them to participate in WII. It emerged that they willingly chose to take part because it had been explained that they would have a chance to get a loan from the bank. They were also assured of a market where they would sell their produce after harvesting, because according to the farmers, marketing their produce is usually a problem and this could have affected payback of the loans, and this was a very good incentive for them to participate. These benefits made WII very attractive for them.

The results imply that access to the loan may have been the only reason for the farmers to participate because when the farmers were asked if they would buy the insurance product without the loan they declined. This may also suggest that farmers do not regard insurance as important. The farmers were asked whether they would choose between insurance with a loan and stand-alone insurance if they were given a chance to do so. All the farmers preferred the option where insurance was bundled with a loan, which suggests how important the loan is to the farmers.

5.1.5 Uses of Insurance Payouts by Farmers.

During the focus group discussions it was mentioned that the farmers experienced a drought during the 2005/06 growing season. The drought triggered a payout but the farmers did not get cash payments. Rather, the insurers paid the claims directly to the bank as a loan repayment on behalf of the farmers, since this is how the WII product had been designed. In general, the farmers reported that they were satisfied with the arrangement. The fact that the farmers were able to repay the loan with the insurance payout meant that, in general, they were happy not to get cash payments. However, some of the farmers indicated that they would prefer getting the money directly because they would use it to meet other household needs after paying back the loan. Paying back the loan meant an assurance that they would get another loan in the next growing season.

The farmers were asked to suggest any improvements that would enhance the benefits of WII if it was going to be implemented again in their area. During the focus group discussions the farmers agreed with one particular farmer who suggested that weather index insurance should be made in a way that makes it possible for them to get the loan as cash and not seed, so that they can grow crops that have defined markets and pay back the loans after they sold their produce. This suggests that a change in the design of WII is required so that farmers will be able to grow crops of their choice. This also emphasizes the fact that farmers perceive WII to be about loan access and cannot see its potential role in reducing climate risks. The implication of this is that even though WII may play a role in managing the risks associated with climate variability and change farmers may not be aware about it. Therefore, it is important to educate farmers about the risks of climate variability and change and the role that WII can play considering that climate variability and change will increase the frequency and magnitude of extreme events (droughts, floods etc.). The fact that the farmers were

satisfied with not getting cash payments indicates that loans are a great need for the farmers and WII came in as a way to access these loans; this was emphasised by the stakeholders who stated that farmers would not participate in the insurance scheme in the absence of loans.

5.2. Understanding the Role of State and Non-State Actors

5.2.1 Responsibilities of state and non-state actors

Table 2 in the previous section shows the different roles played by the state and non-state actors. It was found that the role of conducting awareness which is deemed as important was covered by one stakeholder. This may have affected implementation in the sense that many people that could have been reached with information regarding WII may not have been reached. This suggests that awareness should be a role that cuts across all the stakeholders if scaling up will take place.

5.2.1.1 Views on whether Weather Index Insurance should be a policy issue or not

Participants had different views about WII being a policy issue. Some thought it was too early to talk about policy while others thought those implementing it were not making a strong enough to convince policy makers. The table below shows some of the responses from the state and non-state actors.

Table 6: State and Non-State actor responses to their views on WII as a policy issue

	Quote
State actor 1	“Since the capacity to implement WII is not that much, we cannot go into anything legal right now”
Non-state actor 1	“There is no policy that backs it up and it is having challenges to scale up. If we had a national agriculture policy maybe it could have been stated and therefore backed up. There is a mention of micro insurance in the ASWAP document that government intends to implement weather insurance activities.”
Non-state actor 2	“Yes this should be considered as a policy issue since productivity is highly affected every year by adverse weather incidences”
Non-state actor 3	“Weather insurance is necessary but it has several challenges as highlighted earlier. I believe now satellite stations are being used as automatic weather station installed in growing areas.”
Non-state actor 5	<ul style="list-style-type: none"> • “Those implementing are not aggressive enough to convince policy makers to take it up as a policy issue. • Lack of awareness may mean that even the policy makers do not know about it. Therefore they cannot consider it as a policy issue.”

Non-state actor 1 indicates that WII may be having challenges to scale up because it is not backed up by any policy, implying that it may not be recognised as important. They specifically point to a national agricultural policy which could have addressed WII. Non state actor 1 mentions that micro insurance has been recognized in the Agriculture Sector Wide Approach (a strategy of the Malawi government to increase agricultural productivity). This suggests that WII is important in agriculture and therefore beneficial to farmers such that policy makers may want to consider it as an issue worth being discussed. A lack of awareness

as presented by non-state actor 5 may explain why policy makers have not taken up WII yet. This suggests the need for proper awareness about WII in all the relevant sectors so that it is widely known by the relevant decision makers that would recommend that it be considered for discussion as a possible inclusion in the national adaptation policy.

5.2.2 Challenges to Implementation of Weather Index Insurance

Identifying the challenges associated with the implementation of WII would help to inform providers on how to improve WII uptake and guide the design of more beneficial products for the policy holders and insurers.

The state and non-state actors highlighted the challenges they encountered during the implementation. Study participants’ highlighted challenges of WII as shown in table 7.

Table 7: Challenges to implementing WII by State and Non-State actors

Stakeholder	Challenges
State Actor 1	<ul style="list-style-type: none"> • “Premium payment is very expensive so adoption is very low • Lack of capacity to implement it despite government having political will.”
State actor 2	<ul style="list-style-type: none"> • Lack of a dense and secure network of weather stations • Lack of historical weather data in agricultural areas • High initial cost of Automatic Weather Stations (AWS) • Capacity to maintain AWS and Data Management • Integration of Weather Data from AWS to main Database • Reliable on-going daily data collection.”
Non-state actor 1	<ul style="list-style-type: none"> • Difficult to sell because it is expensive, • It is not appreciated as an insurance product because it is weather oriented,

	<ul style="list-style-type: none"> • Some NGO's that implement climate change projects are not coming forth to take it up
Non-state actor 2	The design of the program was not suitable to the smallholder farmers in Malawi
Non-state actor 3	<ul style="list-style-type: none"> • The policies were mainly issued to cover loans extended by banks, If bank don't lend there is no demand • Local expertise in writing the policy is minimal • WII is usually more expensive than traditional insurance products, • availability of automatic weather stations in crop growing areas
Non-state actor 4	"Expensive."
Non-state actor 5	"Lack of awareness at all levels leading to low adoption."

One of the common challenges being faced that is the capacity to implement WII, as indicated by state actor 1, non-state actors 2 and 3. Lack of capacity has serious implications in that it may lead to unsuccessful implementation; this suggests the need to invest in capacity building.

The other notable challenge highlighted is that WII is expensive, and as pointed out by non-state actor 1, it is difficult to sell. This may be linked to the fact that there are no local experts for the product and that makes it expensive, further stressing the need to invest in capacity building in product design and other aspects of the insurance product.

Lack of awareness at levels is another challenge as presented by non-state actor 5. These levels include farmers and relevant organizations that would be interested in WII. The fact that a lot of people are not aware that WII exists has negative implications on its adoption. For instance, Non state actor 1 mentions organizations that implement climate change

projects as some that have not taken it up. This suggests that those are the type of organizations that should be implementing WII but are not, lack awareness could be one of the reasons.

5.2.3: Recommendations for Improvement of Weather Index Insurance in Malawi

All the study participants were asked to give recommendations on what should be considered as improvements on the pilot program so that it can be implemented successfully in the future. The recommendations are shown in Table 8.

Table 8: State and Non-State actor quoted recommendations for improving WII

Participant	Recommendations
Farmers	“The program should allow farmers to get the loans as cash so that we can invest in crops that have defined markets”
State actor 1	<ul style="list-style-type: none"> • Government should subsidise premiums then scaling up will take place • If banks could be mandated to provide 20% of their loan portfolio to agriculture • Insurance should be compulsory to all agricultural investments • If private companies can take part in the installation of weather stations to support the program e.g. buying automated weather stations
State actor 2	<ul style="list-style-type: none"> • “Build technical capacity because sustainability of the program will depend on the availability of in-country capacity to design weather risk management contracts

	<ul style="list-style-type: none"> • Pilot in other value chains • Identify the appropriate legal and regulatory framework that will specifically address index based products”
Non-state actor 2	<ul style="list-style-type: none"> • “Farmers should understand all the details of the program, • The program should target commercial /progressive farmers not subsistence smallholder and poor farmers because it is too expensive for the poor farmers, • the program should be designed to pay out to the farmers and not insuring the loan provided to by the banks”
Non-state actor 4	<ul style="list-style-type: none"> • “More weather stations better access to data”
Non-state actor 5	<ul style="list-style-type: none"> • “The insurers should be able to sell their product directly to the farmers • Improving markets for crops would make things better for the farmer and would help for farmers to willingly take up or participate in WII • Financers should be able to follow up the farmers because this carries more weight and may affect performance of the WII”

The stakeholders gave recommendations depending on the role they played during the implementation of weather index insurance.

Farmers recommended that getting the loan as cash and not farm inputs i.e. seed and fertilizer would work well for them because they would use the cash to invest in crops of their choice with defined markets. This is in agreement with what Non-state actor 5 recommended that improving markets for the crops would make things for the farmers. Non-state actor 5 further

explained that when farmers are assured of a market for their crops they are motivated to participate in WII.

Non state actor 2 recommended that efforts be made that farmers should understand all the details of the program, this could mean that there were parts of the program that farmers did not clearly understand, this also provides an opportunity include information on how WII can play a role in climate change adaptation so that farmers are aware of this fact.

State actor 2 recommended the investment in capacity building as a determinant of sustainability of WII; they further stated that building local capacity would ensure that there is in-country expertise in the design of WII products. This was presented as one of the challenges that made WII very expensive because it was not developed in Malawi.

State actor 2 also recommended that the implementation of WII should target commercial or progressive farmers as opposed to poor subsistence farmers because it is expensive. It was also recommended that the design of the product be changed so that the payout should directly go to the farmers and not the bank.

5.3 The Role of Weather Index Insurance in Securing Finance for Investment in Climate Resilient Crops

Funding mechanisms for activities aimed at helping developing countries to carry out climate change adaptation are becoming increasingly available as a result of international negotiations. For instance, the UNFCCC looks at approaches to address loss and damage resulting from and makes mention of insurance as an option (UNFCCC, 2008).

Most participants indicated to have little or no knowledge of climate finance. Those who knew a little about it felt that a proper understanding of WII would play a role in securing

funds that would enable the investment into climate resilient crops. Some suggested that it was too early to talk about investing in climate resilient crops in line with WII while it is still in its early stages of development and also when it was not being widely implemented.

Chapter 6: Discussion

This section presents the discussion of the results. Similar to the previous section, the structure of this section follows the themes pattern.

6.1 Understanding and Perceptions of Weather Index Insurance

6.1.1 Farmers understanding and views of state and non-state actors

The study revealed that the understanding and perceptions of farmers towards WII would relate to the way it was introduced to them. In Malawi, weather index insurance was introduced to facilitate access to credit for farm inputs by smallholder farmers. This implies that it was communicated to farmers as a means for them to access loans and the results of the study show that it is how they understand and perceive it, this means that farmers are not aware that WII can be implemented as a shield against risks associated with climate variability and change besides being a way of accessing loans.

The views of the state and non-state actors (Table 4) indicate that farmers do not understand WII. This is in agreement with what was reported by Dercon *et al.* (2008) and Suarez *et al.* (2007). This implies that farmers will understand WII as a way of protecting themselves from climate risks when it is communicated to them as such. Therefore if WII will be implemented as a climate change adaptation strategy then this information has to be included in all future communications that will be made to the farmers regarding WII

It has been established in the study that farmers were aware of changes in climate and were already executing measures to reduce the impacts of those climatic changes (see Table 3). It had been assumed that if farmers were asked some of the measures they employed to reduce the effects of climate change they would mention WII and they did not. When they were

further asked to explain if there is a relationship between WII and climate change, it was established that farmers were not able to tell that a relationship exists. On the other hand, the state and non-state actors were able to describe the relationship that exists between these two (Table 5). This suggests that a knowledge gap exists between the farmers and the state and non-state actors regarding the relationship that exists between WII and climate change. This is one of the issues that need to be understood by farmers especially if they will be implementing WII as a means of dealing with risks associated with climate variability and change. From the responses of the state and non-state actors on the link between WII and climate change (Table 5) it is clear that they are aware that WII can be a climate change adaptation strategy as indicated by state actor 1, this suggests that even though there is an awareness among the state and non-state actors about WII being a potential climate change adaptation tool, farmers have not been properly informed hence their perception that it is a way of securing loans only.

The views of non-state actor 2 (Table 4) indicated that literacy levels of the farmers may have an effect on their understanding of WII, they stated that different types of farmers would have different levels of understanding depending on their literacy levels. They indicated progressive (commercial) farmers as having a better understanding than poor illiterate subsistence farmers and that the progressive farmers should be the ones targeted with WII programs. According to a study conducted by Kapondamgaga and Fisher (2011) it was found that education, is one of the factors that determine farmers' willingness to pay for the insurance. This implies that literacy levels affect the understanding of WII and therefore the willingness to participate in WII. Even though the current study did not look into the literacy levels of the farmers who were interviewed, their ability to participate in the implementation

of WII could suggest that they may have attended school to a certain level and this helped them make a choice on whether to take part in implementing WII or not.

Jaffee *et al.* (2008) indicated how education programs contribute to farmer sensitization of index insurance thereby increasing product demand (willingness to participate) and the satisfaction derived from using the product. They argued that education would increase understanding of the product consequently affecting their take up. The argument by Jaffee *et al.* on farmer education is critical for the success of WII implementation in Malawi even though they indicated that farmer education makes weather risk management programs that target farmers expensive (Jaffee *et al.*, 2008).

6.1.2 Determinants of farmers willingness to participate in Weather Index Insurance

On the factors that determine farmers' willingness to participate in WII, the study revealed that farmers willingly chose to participate based on the benefits they would get from their participation, in this case the loan that was bundled together with the insurance. It was also established that farmers would not have participated in the implementation of WII if it was offered without a loan. This could mean that even if the farmers had a good understanding of WII, they could not have participated if it was not offered without a loan because they were more interested in having access to loans. This could mean that farmers were aware of certain risks such as drought for which the loan provided a sense of security thereby driving their demand for it.

Price of the WII has been identified as one of the main drivers of willingness to participate in WII (Rong Kong *et al.*, 2011), this means that there is no or less willingness to participate when the product has a high price. In this study, farmers neither mentioned the premium costs nor did they indicate that they found WII to be expensive. They further indicated their

willingness to participate as long as the insurance contract was bundled with a loan, this could be because of what was revealed after probing further from the state and non-state actors that farmers did not pay their premium directly to the insurers, rather when they got a bank loan, 5% of the loan covered the premium cost and as such farmers did not have to pay any money for the premiums. The state and non-state actors mentioned that WII is expensive. This could mean that the farmers were not aware about the true cost of WII. It may also imply that the state and non-state actors chose this arrangement in order to facilitate farmers' understanding of WII. However, the study revealed that farmers do not understand WII. This means that the design of the WII product used in Malawi is difficult to understand, therefore WII products need to be designed in a way that makes it easy for the users to understand.

If farmers were paying premiums in cash to the company, it could have had negative implications on farmers' willingness to participate because some of them may not have had money available to pay for WII, in this case, having the insurance package bundled with the loan attracted farmers' willingness to participate. This implies that providing insurance without a loan would attract less participation. Even though farmers were able to participate with the loan attached to the insurance, it could have been good to see if farmers would chose to participate if they were asked to pay the premium cost as cash.

6.1.3 The Use of Payouts

During the study, farmers indicated that they experienced a drought that affected their crop and triggered payout. The insurers paid the money for the payouts to the bank as payment of the loans on behalf of the farmers. Farmers did not get any cash as payouts. Farmers were satisfied with the arrangement because the burden to pay back the loan to the bank had been laid off of them by the insurance. This may explain the sense of security that the insurance brings to the farmers such that getting cash payments may not rank as a priority for them.

However, some of the farmers expressed their interests to be getting cash payments because according to them, they can use the money to improve their lives after paying back the loans, this assumes that they have some money remaining after paying back the loan and implies that farmers would still be impacted by the weather event if they have no money left after loan repayments.

When the farmers were asked how they would use money if the product design was different, they mentioned buying food, school fees, purchase of farm inputs and covering costs for other household needs as some of the uses besides loan repayment. The fact that insured farmers mentioned buying food as one of the potential uses of payout money agrees with what Linnerooth-Bayer and Mechler (2007) reported that the Malawian farmers who insured their crops under WII would not be fully protected against food insecurity because they do not receive cash payments. This suggests that the cash payout is an important component of WII if farmers are going to be shielded against problems like food insecurity which results from the effects of climate variability and change on agricultural productivity. This is in line with the recommendation made by non-state actor 2 (Table 8) that the design of the insurance product should be changed so that farmers should be getting cash payments. However, Suarez *et al.* (2007) indicated that changing the design of the Malawi program to offer other benefits besides the loan guarantee, will make it so expensive that farmers cannot afford it. This implies that changing the design of WII so that farmers can be getting cash payments would raise the cost of the insurance product and may turn out to be a burden for the farmers and may explain why farmers' willingness to participate was not affected by the price of the WII product because the loan guarantee is the component that made it affordable.

6.2 The Role of the State and Non-State Actors in the Implementation of WII

6.2.1 The Roles and Responsibilities of State and Non-State Actors

One of the most important roles that were of interest in this study was that of conducting awareness on WII. Because it was assumed that people had to be aware of the existence of WII for them to be able to participate in its implementation. The study established that only one of the implementing partners i.e. non-state actor 1 was involved in conducting awareness of WII (Table 2). It was also mentioned that lack of awareness stands as one of the challenges that WII is facing in Malawi as highlighted by non-state actor 5 (Table 7), who pointed that the lack of awareness is at all levels, this meant that farmers and other relevant organizations are not aware of the existence of WII and that it has negative implications on the adoption of WII. This concurs with Kapondamgaga (2011) who reported that awareness is crucial for the adoption of WII. This suggests that the role of awareness should not be overlooked as WII is being implemented because people have to have necessary information on WII and can decide adopt based on what they have heard. The fact that only non-state actor 1 took up the role of conducting awareness may suggest that this role was assigned to non-state actor 1 only, and since the results of this study have revealed that people are still not aware about WII, it may mean non state actor 1 did not manage to reach out to those who may be interested to participate in WII. Considering the role that awareness has in the adoption of WII, it can therefore be recommended that all the relevant stakeholders should participate in disseminating information on WII to ensure that people have proper and adequate information. This is in agreement with a recommendation by Hongo (2010) that information dissemination campaigns is a way of dealing with lack of awareness. Therefore based on the

results of this study it is recommended as a good plan for Malawi because it will ensure that farmers and other relevant stakeholders are reached with information regarding insurance.

6.2.2 Views on Weather Index Insurance Being a Policy Issue

The study revealed that WII is not supported by any policy even though most of the actors felt that it should be discussed at policy level and be backed up by a relevant policy. Non-state actor 1 specifically points out that an agricultural policy should support the implementation of WII. This suggests that WII is important for the agricultural sector, especially if it is going to be adopted as one of the climate change adaptation tools for the farmers. This means that the agriculture sector should play a leading role in issues regarding WII including ensuring that relevant policies support its implementation. It has been mentioned already that the design and the price of the product play an important role in determining participation among other things and these are the issues that Hellmuth *et al.* (2007) indicated as worth discussing at policy level to ensure that they are clear and stable. State actor 1 in Table 8 recommended that government should subsidise premium in order to allow for scale up of WII. At the time this study was being conducted, there was no documentation of evidence on the intentions of the government to subsidise premium. These issues should be addressed clearly in a policy if it existed.

Non-state actor 1 indicated that the mention of micro insurance in the Agricultural Sector Wide Approach (ASWAP) by the Malawi government. It is a good step towards the support of implementing WII and provides a conducive environment for policy support by the agriculture sector. The inclusion of weather insurance in the ASWAP is an indication that the Government of Malawi, through the agriculture sector, recognizes WII as having a role to play in managing weather related risks, consequently contributing to increased agricultural productivity and reducing hunger.

It is worth mentioning that the ASWAP operates with the National Policy framework for Malawi by operating within the key priority areas of the Malawi Growth Development Strategy (MGDS). Even though climate change adaptation is not explicitly mentioned in the ASWAP document, its aims at reducing the impacts of climate change and directly relate to adaptation. This is well stipulated in the ASWAP document under the goals for agriculture and food security where it is stated that they would like “*to reduce food shortages even in times of disasters (droughts or floods)*” (GoM 2010: 4). Since the results of the study show that WII is not backed up by policy, its inclusion in ASWAP shows a good direction towards policy support for WII. It is strongly recommended that relevant future studies look into finding out the extent to which the ASWAP achieved the goal of developing a weather insurance product for farmers and how farmers benefit from it as weather related risks increase. It would also be important to know that the state and non-state actors have taken it up on themselves to advocate or lobby for WII to be addressed by a specific policy

6.2.3 Challenges of implementing WII

6.2.3.1 Lack of Capacity to Implement WII

Some of the state and non-state actors indicated that there were challenges to effective implementation of WII. State actor 2 is specific on data management and the capacity to maintain automated weather stations (AWS). The lack of maintenance of AWS would negatively affect the availability of weather data which is one of the major requirements for the successful implementation of WII (IFAD, 2011). Non-state actor 3 indicated that the expertise to write the insurance policy is not available locally. This was one of the lessons drawn from the pilot project when it was recommended that the insurance sector in Malawi should take a larger role in contract design and underwriting (Bryla and Syroka, 2009). This means that by the time this study was being conducted, the capacity of the insurance sector to

design and underwrite WII contracts had not been built. This observation stresses the need to invest in building local implementation capacity including that of the farmers through education programs in order to enhance their ability to understand WII.

6.2.3.2 Weather index insurance is expensive

Most of the state and non-state actors indicated that WII is expensive. This is why it was recommended that targeting should be towards commercial farmers and not subsistence farmers because the former would afford it, however if WII will be implemented as a climate change adaptation measure then even the subsistence farmers should be able to benefit from its implementation and this is where government should look into other options such as subsidising the cost of the premiums as recommended by Collier *et al.* (2009), so that if the premium cost is the hindrance for participation for subsistence farmers then they will be able to afford it.

6.3 Insurance as a means to secure finance for Climate Resilient Crops

The international change negotiations have led to an increase in funding mechanisms for activities aimed at helping developing countries to carry out climate change adaptation. Lack of knowledge on such financing mechanisms by state and non-state actors suggests the need for more efficient dissemination strategies about climate finance solutions.

While some state and non-state actors indicated having knowledge of the finance mechanisms, they felt that they need proper understanding of the role that WII would play in securing funds for investment into climate resilient crops. Some suggested that it was too early to talk about investing in climate resilient crops while WII was still not fully developed and also when it was not being widely implemented. The study established that the understanding of WII by farmers and relevant organizations and its adoption must improve

before using it to secure finances. This implies that WII can be used to secure finances for investment in climate resilient crops and agrees with Chinsinga *et al.* (2012).

Chapter 7: Conclusion

Climate change has been marked as one of the most serious problems of the 21st century. Smallholder farmers have been listed as one of the groups that are vulnerable to its effects because their occupation, agriculture, is solely dependent on climate and the weather. Farmers have had ways of adapting to the effects of climate change for a long time. WII has been pointed out as a potential tool for climate change adaptation. It has been piloted and implemented in Malawi but not as a climate change adaptation strategy. The study was able to establish that while farmers are aware of climate change, they do not perceive WII as a potential tool to shield them against climate change effects because of the way it was designed and introduced to them. Literacy levels also contribute to farmers' understanding of the product. This study identified key issues that may be important for the recognition of WII as a potential tool for climate change adaptation. The key issues are summarized by theme below:

Theme 1: understanding of climate change and weather index insurance

WII is not understood as a potential climate change adaptation tool by farmers in Malawi.

Farmers implement WII because it allows for them to access loans from the bank. This is how it has been perceived and understood. Farmers need to be made aware of the fact that WII can also be a climate change adaptation tool for their perceptions to change. This has been attributed to the design of the product by some state and non-state actors who participated in this study. The state and non-state actors are of the view that WII can be implemented as a climate change adaptation strategy if the design of the product changes,

some of the proposed changes include paying out directly to the farmers in an event that a drought or a flood triggers payment, it was also found that improvement in awareness will improve its adoption.

Levels of literacy affect farmers understanding of WII

This study and other previous ones have found out that education affects the understanding of the insurance product by the farmers. This could affect the demand for or the willingness to participate in WII consequently affecting scaling up of WII. Therefore enhancing the understanding of farmers is important and will require the inclusion of an educational component in WII programs. There is also need to educate the farmers on the risks associated with climate change and how WII can be implemented as a measure in climate change adaptation

Lack of awareness of the WII product

The fact that other people may not be aware of the existence of WII may affect its adoption and also its being supported by relevant policies because even the policy makers may not be aware that there is WII. The reasons for lack of awareness may be that other stakeholders are not taking part in conducting awareness (because they are not aware that they have to) for the product to be widely known as established in the study.

Theme 2: The role of state and non-state actors in the implementation of WII

The implementation of WII requires legal framework

WII is a policy issue and for it to be implemented effectively there is need for a policy that would address issues of importance such as crop prices and subsidies for premiums. The study established that farmers prefer to grow crops that have defined markets and these are

the crops they would insure. This further stresses the need for policies to address these issues so that WII is effectively and successfully implemented.

WII requires investment in capacity building at all levels (farmers and the rest of players)

For WII to be implemented effectively there is need to develop the skills of the stakeholders at all levels. Farmers need education on the basic aspects of WII for their understanding to be enhanced and also on other roles that WII can play e.g. climate change adaptation. Insurers need to enhance their capacity to develop the insurance product so that it is not expensive. There is need to develop capacity in the installation and calibration of automated weather stations. An investment in capacity building is important for the success of WII.

Theme 3: The role of Weather Index Insurance in Securing finance for climate resilient crops

Weather Index Insurance can be used to secure finance for climate resilient crops.

WII can play a role in climate change adaptation as a means of securing finances for investment in climate resilient crops. This will depend on stakeholders' knowledge that there are such funds available and how they can be accessed, it will also depend on the scale of implementation of weather index insurance, and at the level that Malawi is at the moment, failing to scale up, it would be difficult to secure funds.

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Chapter 9: Appendices

9.1 Appendix 1

9.1.1 Questions for farmers

Theme 1: Understanding and perceptions of weather index insurance (farmers, state and non-state actors)

What do you do for a living?

Kodi mumagwira ntchito yanji yomwe imakuthandizani pa moyo wanu wa tsiku ndi tsiku?

Do you know anything about climate change? How has it affected you?

Kodi mukudziwapo kena kalikonse kokhudzana ndi kusintha kwa nyengo? chasintha ndichani pa moyo wanu chomwe mukuona ngati ndizotsatira za kusintha kwa nyengo?

What are you doing to make sure the effects of climate change do not affect you severely?

Nanga mukupanga chani chomwe chikukuthandizirani kuchepetsa mavuto akudza kamba ka kusintha kwa nyengo?

Have you ever experienced any weather event that you think is a result of climate change?

Kodi mungandiuze chomwe chinachitikapo chomwe munganene kuti chinachitika chifukwa nyengo yasintha?

How were you affected and what did you do to make sure things were not out of hand?

Inu munakhudzika bwanji ndizomwe zinachitikazo ndipo munapangapo chani kuti muonetsetse kuti moyo wanu ukupitilira monga mwa masiku onse

What do you understand by weather index insurance, what does it mean to you? Monga mwakumvetsetsa kwanu, munganene kuti weather index insurance ndi chiyani ndipo zimatanthauza chani kwa inuyo?

How did you know about weather index insurance?

Munadziwa bwanji za inshuransi imeneyi?

Did anyone force you to participate or it was your own choice?

Kodi munachita kupemphedwa kapena ku kakamizidwa kuti mulowe nawo kapena munachita kusankha nokha kuti mupange nawo?

What crops do you grow and which one/s are insured? Why did you insure part or all of your crops? Mumalima mbeu zANJI? Nanga ndi ziti zomwe munazilowetsa mu inshuransi, ndi chifukwa chani munangosankha kulowetsa mbewu imodzi yokha kapena zonse mu inshuransi?

What do others, who are not taking part say about your participation? Kwa amene sanatengepo mbali pa inshuransi amanenapo chani za nkhani imeneyi?

What has changed in your life as a result of your participation in weather index insurance?

Chomwe mukuona kuti chinasintha ndi chani pa moyo wanu chipangireni za inshuransi

Have you ever received a pay out before?

Kodi munayamba mwapatsidwapo chipukuta misozi cha inshuransi?

What did you use the payout money for?

Munachigwiritsa ntchito yanji chipukuta misozi chimenechi?

Can you recommend any improvements to WII so that it is more effective and beneficial?

Mungafune kusintha kwanji mu ntchito ya inshuransi kuti ikhale yopambana?

9.1.2 Questions for state and non-state actors

Theme 2: The role of state and non-state actors

How did you find out about index based insurance?

Why did you decide to participate in index based insurance?

What is your role in the whole process?

What are the challenges to implementation?

Do you think WII and climate change are linked? If yes, how?

How do you see WII having a role to play in climate change adaptation for farmers?

What do you think should change/Improve in the implementation of WII that would make it effective (if it is not. any state actors that you would want involved)

Do you think farmers participate for the insurance or the loans attached to WII?

Do you think farmers understand WII?

What determines farmers' participation in weather index insurance? Do you think this may affect the scaling up of weather index insurance?

Can this be a policy issue?

What mechanisms have you put in place to scale up WII/ is the government or any donor agency taking part in scaling up WII, in what way?

Theme 3: Weather index insurance as a means of securing finance for investment in climate resilient crops

Do you know anything about climate finance?

Do you think weather index insurance can contribute to securing finance to invest in more climate resilient crops?

9.2 Appendix 2

9.2.1 State and non-state actors consent form

Assessment of the role of weather index insurance in climate change adaptation in Malawi

Consent Form

Researcher's Name: Asimenye Nthakomwa-Chitika

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You are invited to take part in a research study of the assessment of the role of weather index insurance in climate change adaptation in Malawi

The study would like to find out if weather index insurance can play a role in climate change adaptation in Malawi.

You will be required to respond to questions that will take 30-45 minutes of your time

There are no anticipated risks to you if you participate in this study, beyond those encountered in everyday life. However, it is hoped that the results of the study will help state and non-state actors recognize the role of weather index insurance in climate change adaptation and advocate for its full scale implementation in Malawi.

Taking part in this study is completely voluntary. If you choose to be in the study you can withdraw at any time without consequences of any kind.

The records of this study will be kept private on a personal computer which is locked with a password known by the owner only. Any report of this research that is made available to the

public will not include your name or any other individual information by which you could be identified.

Contact the researcher at the email address or phone number above. You will be given a copy of this form to keep for your records. If you have any questions about whether you have been treated in an illegal or unethical way, contact the environmental and geographical sciences department at the University of Cape Town on the email indicated above.

Statement of Consent

I have read the above information, and have received answers to any questions. I affirm that I am 18 years of age or older. I consent to take part in the research study of assessing the role of weather index insurance in climate change adaptation in Malawi. I am aware that my responses will be treated as confidential and that I can withdraw my participation at any time during the study.

Participant's Signature

Date

9.2.2 Farmers Consent form (Chichewa Version)

Fomu yololeza kutengapo mbali mu Kafukufuku ofuna kudziwa momwe inshuransi ingathandizire pothana ndi mavuto odza kamba ka kusintha kwa nyengo.

Dzina La opanga kafukufuku: Asimenye Nthakomwa-Chitika

Oyang'anira: Olivier Crespo PhD

Komwe wachokera: University of Cape Town_ Department of Environmental and Geographical Sciences

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Muli kupemphedwa kutengapo mbali pothandizira kuyankha mafunso omwe athandizire mu kafukufuku yemwe cholinga chake ndikufuna kudziwa momwe weather index inshuransi ingathandizire anthu pothana ndi mavuto akudza kamba ka kusintha kwa nyengo m'Malawi muno. Mafunsowa akutengerani mphindi 30 kapena 45 ndipo ndikukutsimikizirani kuti palibe choopsya china chili chonse chomwe chingachitike chifukwa mwathandizira kuyankha mafunsowa. Tili ndi chiyembekezo chakuti zotsatira za kafukufuku ameneyu zidzathandizira mabungwe a boma kapena omwe si a boma kudziwa za ubwino wa index inshuransi komanso kuthandizira kuti anthu aziyigwiritsa ntchito mdziko muno.

Simuli kukakamizidwa kutengapo mbali poyankha mafunso a mu kafukufukuyu ndipo ngati pali funso lomwe simukufuna kuyankha pa zifukwa zina mukhoza kunena komanso ndinu omasuka kunena kuti mukufuna musatengenso mbali popanda chovuta china chili chonse. Chili chonse titakambirane pano chikhala cha chinsinsi ndipo patakhala mpata ofuna kugawa zotsatiraza kafukufukuyu maina anu sadzaoneka pena pali ponse.

Mukafuna kuti zotsatira za kafukufukuyu zikupezeni imbani foni ku nambala yomwe yaikidwa ku mayambiro kwa fomuyi ndipo mudzathandizidwa komanso mukaona kuti simunalemekezedwe mwanjira ina iliyonse mukhonza kudziwitsa dipatimenti ya za chilengedwe ku univesite ya kepi tawuni poyimba nambala ili pa mwamba pa

Kuvomereza kutengapo Mbali

Ndawerenga ndikumvetsetsa zalembedwa mu fomuyi ndipo ndayankhidwa mafunso omwe ndinafunsa.

Ndikutsikimiza kuti ndili ndi zaka zoposa 18 zakubadwa ndipo ndavomera kufunsiwa mafunso a mu kafukufuku okhudza za momwe weather index inshuransi ingathandizire a Malawi pothana ndimavuto okudza kamba ka kusintha kwa nyengo.

Ndikudziwa kuti zomwe ndayankha pano zikasungidwa mwa chinsinsi komanso nditafuna kusiya kutengapo mbali mu kafukufukuyu ndikhoza kusiya kuyankha mafunso popanda chovuta chili chonse.

Participant's Signature

Date