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Effects of Awareness Creation on Smallholder Crop Farmers' Willingness to Join Crop Insurance Schemes in Tanzania: A Case of Iringa Rural District

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Keywords:
Crop Insurance,
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farmers.

This study investigated factors affecting smallholder crop farmers' willingness to join crop insurance schemes in Tanzania: a case of Iringa rural district. Specifically, the study examined the awareness of the existing agriculture insurance schemes in the Iringa Rural District. The study's sample size was 88 respondents, where 73 were selected randomly while 15 were selected purposively. A descriptive survey design was applied, where simple random and purposive sampling techniques were used to collect data. The quantitative data was analysed using (SPSS) version 21, where descriptive statistics analysis was performed by generating frequency distribution tables, as appropriate, based on objectives. In addition, correlation analysis was employed to examine the relationship between variables. The qualitative data was collected through interviews and was analysed thematically. From the result, the level of awareness has a positive relationship with the willingness of smallholder crop farmers to join crop insurance. Ensuring understanding of the existing agriculture insurance schemes among smallholder crop farmers increases the level of willingness of farmers to join crop insurance in the Iringa Rural District. Also, setting affordable crop insurance prices depending on smallholder farmers' ability to pay increases the willingness of smallholder crop farmers to join agriculture insurance. It was therefore recommended that awareness of insurance premiums be a continuous process since it increases the willingness of farmers to join crop insurance schemes.

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INTRODUCTION

Agriculture is an essential economic activity in both developed and developing countries. America and Asia managed to make progress by investing in agriculture. Agriculture, rather than the manufacturing or tertiary sectors, was the real driving force in spectacular success against absolute poverty (Montalvo & Ravallion, 2019). And that agriculture has a four times multiplier effect on the economic growth of a country than the manufacturing and service sectors (Ravallion & Chen, 2020). In Africa, agricultural activities contribute between 25 and 40 percent to Gross Domestic Product (GDP). The sector employs up to 60 percent of the working population. However, as much as 80 percent of production is undertaken by smallholder farmers. Agriculture is characterised by high exposure to risk (Musonda, 2012). Vagaries of nature like drought, floods, and pest and disease infestation can cause risks in farming (Kumar et al., 2011). Droughts and other natural calamities have become serious threats to agricultural production. For this reason, there is a need for a mechanism that can help reduce risks and uncertainties by employing risk management tools such as crop insurance (Kumar et al., 2011). However, farmers have less access to risk management options needed to cope with natural calamities and uncertain events when they occur (Rola & Aragon, 2013).

Crop insurance is acknowledged to be a fundamental tool for stabilising farm income by facilitating farm investment, technology adoption, and flow of credit in agriculture (Kumar et al., 2011). Crop insurance is an instrument that provides financial compensation to farmers for production or revenue losses (Mahul & Stutley, 2010). Crop insurance enables individuals who face production and other risks to turn a future and unforeseen loss, which is usually high, into an anticipated, certain, and lower premium (Musonda, 2012). The fundamental principle underpinning crop insurance is that the loss

incurred by a few farmers is shared among other producers in the same locality who are involved in similar activity. Crop insurance provides the most promising means to overcome threats to agricultural production and improve rural welfare (Dragos & Mare, 2014).

Crop Insurance is a risk management control structured to equal agriculture risks and reduce the consequence of natural disasters, especially for small-scale farmers (Estacio & Mordeno, 2001). The common risks associated with agriculture include natural disasters such as droughts, floods, pests, and diseases. The susceptibility of agriculture to these disasters is compounded by the outbreak of epidemics and man-made disasters such as fire, the sale of spurious seeds, fertilisers and pesticides, price crashes, scrupulous middlemen, etc. All these events are beyond farmers' control, severely affect production, and farm income.

The closer a community's livelihood is to the weather, the greater its exposure to climatic variability and extreme risk. For example, many rural communities in sub-Saharan Africa rely primarily on rain-fed agriculture or pastoralism and struggle to cope with climatic variability (Cooper et al., 2008). These vulnerable populations face immense challenges to adapt to climate change. This means there is a need for an instrument that focuses on developing flexible, long-term strategies for reducing vulnerability, improving resilience, and enabling adaptation to natural catastrophes and climate change if food security is to be attained.

Several studies have been conducted to shed light on the factors affecting farmers' awareness of crop insurance and willingness to pay. Studies on crop insurance decisions and willingness to pay include (Ellis, 2017). Coble et al. (1996) observed that participation in crop insurance increases as farm size increases. Diversification also reduces participation, while output variability and income risk increase participation. Moreover, crop

insurance programs are likely to be more successful in ecosystems where output is more volatile, farmers are better educated, and debt is a concern (Smith & Watts, 2019). Factors such as farm size, diversity of products, age of beneficiaries, insurance level, and prior records of outcomes (risks) have been identified to have a negative influence on the tendency and adaptability of soya farmers to insurance uptake in Golestan Province, Iran (Danso-Abbeam et al., 2014). An investigation of corn insurance markets in Iowa, United States, found that risk characteristics of producers, income level, and insurance cost influenced farmers' choice of yield and revenue insurance products (Makki & Somwaru, 2001). Other authors have argued that producers with higher insurable risk are anticipated to have higher demand for crop insurance and greater use of more comprehensive insurance products (Sherrick et al., 2004).

A study by Danso-Abbeam et al. (2014) indicated that marital status, education, tenure, farm age, income level, and awareness of farm insurance were significantly related to the amount of premium Ghanaian cocoa farmers were willing to pay. Also, marital status, educational level, and awareness of crop insurance were positively associated with Ghanaian farmers' willingness to pay for crop insurance (Ellis, 2017). Another study identified age, education, access to extension services, and farm income as significant factors influencing Nigeria's willingness to take agricultural insurance (Falola et al., 2014).

A study in Ethiopia indicated that income level and ownership of radio are positively related to the willingness to pay for crop insurance, while off-farm income and age are negatively associated with the willingness to pay for insurance (Abebe & Bogale, 2014). In addition, the choice to purchase insurance is positively correlated with the previous amount of insurance claims (Abebe & Bogale, 2014). Studies show that insurance appears too expensive for smaller farms, hence more likely to be patronised by larger farms. This finding is supported by Enjolras and Sentis (2011) in their study on crop insurance policies

and purchases in France. The result has implications for Ghanaian farmers, where the majority are smallholders operating less than 2 hectares of land.

Diverse challenges restrain the improvement of crop insurance (Ellis, 2017), including planned risk (Spicka & Hnilica, 2013), determination of the premium rate, and absence of long-term data on agricultural output. According to Just et al., three ways that usually attract farmers to purchase crop insurance include subsidy effect from the government, motivation in risk aversion, and adverse selection among farmers (Smith & Watts, 2019). Risk aversion is the best option to indemnify small-scale farmers against climate-related risks.

Agriculture is the primary economic sector in Tanzania. It represents 28.7% of the country's GDP, provides 85 per cent of exports, and accounts for half of the employed workforce (Tanzania Invest, 2021). This means there is a very high dependence on the agricultural sector in the country. This strong dependence on agriculture makes Tanzania's economy highly vulnerable to weather shocks and fluctuating commodity prices. About 76% of Tanzania's population depends on agriculture to survive, and due to a lack of knowledge and infrastructure to develop and implement some agricultural technology, any droughts, floods, or temperature shocks can severely damage the living standards of the people and create huge increases in unemployment, hunger, and malnutrition rates, as well as, in really severe cases, mortality rates due to starvation. In 2012, the agricultural sector grew 4.3 per cent, less than half of the Millennium Development Goal target of 10.8 per cent (Tanzania Invest, 2021).

However, the economic performance of the agricultural sector is usually uncertain due to its biological nature, in addition to relying mainly on rain-fed agriculture and livestock rearing under natural conditions. This type of production is inherently risky because of the variability of rainfall, animal mortality due to livestock diseases, and fluctuations in output prices. The

environment in most low-income countries, including Tanzania, is characterised by crop diseases, flooding, illness of household members, and crime. As a result of a combination of many factors, many people in low-income countries, including Tanzania, live in poverty and food insecurity. They face many risks and uncertainties which arise from natural, economic, and socio-political environments. These risks and uncertainties easily trigger food shortages, deterioration in nutritional status, and destitution (Pinstrup-Andersen, 2009).

The Government of Tanzania and the Private Sector saw the importance of introducing crop insurance schemes to boost the country's agriculture sector. Efforts to introduce crop insurance in Tanzania began in 2010 when an agricultural insurance working team was formed. Bhushan et al. (2012) pointed out that introducing crop insurance to farmers is associated with awareness of the importance of using insurance to be safe from agricultural risk. Despite the efforts to adopt crop insurance and the benefits of agriculture insurance in reducing poverty, studies show that farmers in Tanzania are not willing to join crop insurance schemes, which is, thus, the problem. This is thus a significant setback as despite the efforts put in place to increase agriculture production by managing agriculture risk through crop insurance, and the adoption rate is still very low, hence the inability to achieve the goals set to reduce agriculture loss and thus poverty.

Stutley (2020) suggested that potential crop insurance schemes can be introduced for the benefit of farmers for crops like maize, coffee, sunflower, sorghum, rice, tobacco, and cotton. They further argued that the Tanzania Federation of Cooperative (TFC) and Tanzania Commission for Cooperative Development (TCDC) should proceed to champion the move of creating awareness because they have many affiliated member organisations. Creating awareness first needs research to determine why farmers are unwilling to adopt the crop insurance move. Research was required to determine factors

affecting smallholder crop farmers' willingness to join crop insurance schemes in Tanzania to develop a new approach to addressing the problems. Therefore, this study investigated the factors affecting small farmers' willingness to join crop insurance in the Iringa Rural District.

In response to the inherent uncertainties and vulnerabilities associated with agricultural activities, the Government of Tanzania and the private sector saw the need to introduce crop insurance as a risk-hedging mechanism. Efforts to introduce crop insurance in Tanzania began in 2010 when an agricultural insurance working team was formed. Prior to this initiative, several efforts with the assistance of the International Finance Corporation, the private sector arm of the World Bank Group, had been made by the industry to pilot private sector-led Crop Weather Index Insurance in Tanzania (TIRA, 2018). Crop insurance is envisioned as a vital tool that can shield smallholder farmers from catastrophic losses, enhance their resilience, and provide a safety net to protect their hard-earned investments.

Despite the recognised importance of crop insurance, a substantial challenge persists: smallholder crop farmers in Tanzania are reluctant to join crop insurance schemes (Mulokozi, 2023). This reluctance is a matter of grave concern, as it exposes a significant portion of the population to the vagaries of nature and market fluctuations. Smallholder farmers face the constant threat of financial ruin, food insecurity, and economic instability without adequate risk mitigation measures.

Therefore, the central problem addressed by this research study is as follows: Despite the pivotal role of agriculture in Tanzania's economy and the introduction of crop insurance as a risk-hedging mechanism, smallholder crop farmers continue to resist these schemes. The precise factors and underlying reasons contributing to their unwillingness to participate in crop insurance programs remain undisclosed. This study seeks to uncover and comprehensively analyse these factors, shedding light on the critical issues

impeding the adoption of crop insurance among smallholder farmers in Tanzania. To examine the level of awareness on the existing agriculture insurance schemes in Iringa Rural District. This study intended to examine the Effects of Awareness Creation on Smallholder Crop Farmers' Willingness to Join Crop Insurance Schemes in Iringa Rural District.

LITERATURE REVIEW

Attitude-Behaviour Paradigm and Theory of Planned Behaviour

While economists rely on the concept of preferences to determine what people value, psychologists and sociologists strongly relate to the attitude concept. The main difference between the two concepts is that preferences pertain to choices between alternatives, whereas attitudes focus on "the desirability of a single action or object" (Green & Tunstall, 1999; Kahneman et al., 1999). A "classical" attitude-behaviour paradigm would assume that attitudes can predict behaviour. This would mean that general attitudes, such as *the cost of crop insurance*, directly and positively affect WTP. Indeed, several studies have shown such effects (Cooper et al., 2004; Kotchen & Reiling, 2000). The basic attitude-behaviour model is still part of thinking in social psychology, although approaches are going beyond this simple paradigm. Ajzen's (1991) theory of planned behaviour has been successfully applied to various behavioural domains (see Dragos & Mare, 2014) is one of these approaches. According to Ajzen, the intention to perform a behaviour is the immediate determinant of the behaviour in question, including "the behaviour of paying money for good" (Ajzen et al., 1996). Three determinants of behavioural intention are proposed: *attitude toward the behaviour*, *subjective norm*, and *perceived behavioural control*. The attitude toward the behaviour refers to an individual's positive or negative evaluation of performing the behaviour. The subjective model captures an individual's perception of social pressure from reference group members to enact the behaviour. Perceived behavioural control includes the

perceived ease or difficulty of performing the behaviour. Concerning public environmental goods, WTP is expected to increase with a more favourable attitude toward paying for such goods, increasing social pressure toward paying, and increasing perceived behavioural control regarding paying for such goods. The theory of planned behaviour is confirmed in several studies (Ajzen et al., 1996; Meyerhoff, 2006)

Models of Altruistic/Moral Behaviour

Theories of altruistic behaviour are discussed in the valuation literature in the framework of a contribution model, which is a counterpart to the purchase model typically assumed (Guatam et al., 1994). Models of altruism are based on a broader motivational structure than standard economic models. One possibility to "enable" altruistic behaviour in economic terms is to use a utility function that incorporates a "taste for having other people better off" (Guatam et al., 1994), where "others" does not necessarily refer to human beings but also to environmental amenities. Altruistic motivation can lead to perceived obligations to contribute to preserving environmental goods. It is also known that some people like "to do good", irrespective of specific perceived interests. People might perceive a general obligation to support good causes and benefit from contributions for "whatever reason". In this respect, contributions to perceived goods are just one way of obtaining satisfaction among many others. In economic valuation, general feelings of obligation are discussed in terms of "a warm glow of giving" or "purchase of moral satisfaction" (see, e.g., Kahneman & Knetsch, 1992 for a baseline model). People may derive utility from altruistic behaviour per se, independent of the fact that others will be better off. This leads, for example, to "impure altruism" in the model of and is termed "participation altruism" in the model of Kahneman and Knetsch (1992). Kahneman and Knetsch (1992) use these concepts to explain what is known as the embedding effect, that is, the observation that sometimes WTP does not vary with the quantity of the good in question. If people only derive utility from giving, then it does not matter what

quantity of the good is provided. However, Kahneman and Knetsch (1992) pointed out that moral satisfaction may vary with the good: some goods give more satisfaction than others. They also provide empirical evidence for purchasing moral satisfaction (concerning a good-specific moral obligation). Taken together, it can be expected that WTP is positively affected by both a *subjective obligation to pay* for the specific good and a *general warm glow* which is independent of the specific good in question.

Norm-Activation Model

Schwartz's norm-activation model (Schwartz, 1977; Schwartz & Howard, 1982) has been developed to explain (altruistically motivated) helping behaviour. It has also been applied to personal issues such as individuals' WTP. The norm-activation model assumes that a personal norm leading to moral obligations regarding a specific action (such as paying for environmental goods) is only activated and transformed into behaviour if certain conditions are fulfilled. Schwartz's theory is a cognitive and sequential decision model that covers the entire process from norm activation to action. The model is quite complex and difficult to test empirically. Although different specifications of the model can be found in the literature, also concerning WTP for environmental goods, most specifications include the awareness of need and responsibility as determinants of norm activation. Awareness of need refers to the precondition that individuals must recognise that something has to be done concerning the object in question. Awareness of responsibility means that individuals must acknowledge that they are responsible for doing something. Given awareness of need and awareness of responsibility, a perceived moral obligation can result in a specific behaviour. Both determinants mediate the effect of a perceived moral obligation on behaviour. In the context of WTP analyses, the *personal norm* to pay for the goods, awareness of the need to provide the good, and awareness of responsibility for paying are considered behavioural determinants. The personal norm equals more or less the subjective obligation to pay which was discussed in the

preceding models of altruistic behaviour. It is expected that the awareness of the need and the awareness of responsibility positively affect WTP when considered as interaction terms with the subjective obligation to pay.

Empirical Literature Review

Most rural farmers are illiterate and unaware of new technologies such as insurance. An assessment in Ethiopia found that 49 per cent had never heard of insurance, 41 per cent did not know how it worked, and 25 per cent did not know where to find it (World Bank, 2018). Educated farmers and pastoralists portray higher demand, while less educated illustrate lower demand (Giné & Yang, 2009; Hess & Suarez, 2009; Hill et al., 2019). Literacy is not only essential to know about insurance but also to understand insurance contracts correctly. Demand remains low when farmers cannot understand concepts like basis risk (Stoeffler et al., 2020).

Education and information tend to run concurrently. While insurance providers might not change the literacy skills of the farmers, they can provide more information. The evidence shows that where information has been provided, farmers and pastoralists increase their understanding of insurance as well as demand (Patt et al., 2009; Lybbert et al., 2010; McPeak et al., 2006; Takahashi et al., 2016; Belissa et al., 2020; Vasilaky et al., 2019; Ali et al., 2020a). Information might be provided through games (McPeak et al., 2006; Vasilaky et al., 2019), information brochures (Takahashi et al., 2016), or training sessions (Dercon et al., 2014). However, it is not merely information or literacy but a better understanding of insurance concepts and underlying mechanisms that are crucial. While farmers might know more about insurance, demand does not seem to improve with knowledge automatically (Takahashi et al., 2016). Exposure needs to be consistent to nudge demand. Previous experience also matters in that farmers who have previously been insured are more informed and, hence, more likely to purchase insurance again (Karlan et al., 2014; Castellani and Viganò, 2017;

Belissa *et al.*, 2020). Insurance providers could, therefore, invest in increasing insurance awareness through more marketing campaigns and training.

Ghazanfar *et al.* (2015) investigated the factors influencing farmers' decisions to purchase crop insurance in Pakistan. Their findings revealed that the majority were interested in insurance, but a large number of farmers still had no interest. The study showed that low literacy rates and awareness of crop insurance and its expected benefits might be the reasons for this. Farmers with more loss experience were more interested in purchasing crop insurance because they felt insecure about their future yield production, so they thought it was way better to have crop insurance to avoid losses from future climatic hazards.

Garrido & Zilberman, (2008) found that Indian maize farmers were not aware of the products and procedures of crop insurance, which contributed to limited demand for it. The inability of farmers to assess the benefits of crop insurance is one factor that contributes to limited demand for crop insurance (Garrido & Zilberman, 2008). According to Garrido & Zilberman, (2008), the expected rate of return on insurance is an essential factor when determining the demand for crop insurance. The high prevalence of crop-damaging weather occurrences will likely continue to push the demand for crop insurance for the coverage of losses (FAO, 2018). Fu & Li, (2018) argue that even if 100% coverage protected historical yields, only 25 percent of farmers would purchase crop insurance without any subsidy.

Geoffrey and Fabian (2012) tried to understand which factors would affect crop insurance decisions in France and Italy. It was the first attempt to measure the determinants of crop insurance purchases in two European countries. It was noticed that purely agricultural indicators such as the size of the farm, measured by the cultivated area, and diversification, measured by the number of cultivated crops, were critical factors in the insurance purchase decision in both

countries. Consequently, a cultivated surface is expected to affect agricultural insurance demand.

Crop insurance is a valuable arrangement, especially for smallholder farmers. First, It is essential to understand how willing farmers may be to join and, if not, determine the limitations to find resolutions ensuring that the ultimate goal is achieved and intended. Several studies, such as Jia-Lin *et al.* (2018), Muta and Usami (2019), and Gulseven (2020), have been conducted researching the willingness of farmers to pay crop insurance outside and inside Tanzania; however, there were no studies done on the factors affecting smallholder crop farmers' willingness to join crop insurance schemes in Iringa Rural District. Therefore, this study investigated the factors affecting smallholder crop farmers' willingness to join crop insurance schemes in the Iringa Rural District.

RESEARCH METHODOLOGY

The study was conducted among farmers in the Iringa Rural District. Iringa Rural District was chosen because it is known to be one of the districts that highly depend on agriculture, with about 73% of the economically active people employed in the sector. Agriculture generates nearly 99% of the GDP of Iringa District; this is mainly by smallholder farmers. Given that most active people are employed in agriculture, it was relevant. It was impactful that the study was conducted on the farmers in the region to eventually better understand the factors limiting smallholder farmers from joining crop insurance schemes. Nevertheless, no studies were done on the factors affecting smallholder crop farmers' willingness to join crop insurance schemes in the Iringa Rural District.

The study adopted quantitative and qualitative research approaches to selecting an approach. In this study, the population included 270 registered smallholder farmers in Iringa Rural District as per Tanzania Farmers Association-Iringa (Jumbe, 2021). Research design refers to the overall strategy chosen to integrate the different components of the study coherently and logically,

thereby ensuring that you effectively address the research problem (Lesinsca & Abbott, 2017). Kothari (2019) describes research design as a researcher systematically collecting and analyzing the data needed to answer the research questions. It is a blueprint for data collection, measurement, and analysis. The study used a descriptive survey design because it is economical and allows gathering data on a once-off basis to describe the nature of existing conditions. It is further preferred because of the speed of gaining information and the fact that it allows for gathering data quickly, an important consideration for this study. In this study, two sampling techniques were used. First, simple random sampling was used in the quantitative part, where respondents were selected randomly. Also, the study used purposive sampling to select participants in the qualitative aspect. A simple random sample was applied to choose the category of registered smallholder farmers in Iringa Rural District in three wards of Kalenga, Mseke, and Isimani that were to be involved due to the vitality of their information about the aim of the study. Every registered smallholder farmer in Iringa Rural District had an equal chance of being selected, while purposive targeted agricultural officers. The study's sample size was 88, where 73 were from the quantitative part, and 15 were from the qualitative. To minimize errors, the researcher took a sample size of 73 observations from 270 registered smallholder farmers in the Iringa Rural District.

Then, the data was analysed using (SPSS) version 21, where descriptive statistics analysis was performed by generating frequency distribution tables, as appropriate, based on objectives. Also, correlation analysis was employed to examine the relationship of variables. The qualitative data was collected through interviews and was analyzed thematically.

Validity determines whether the research truly measures what it is intended to measure or how truthful the research results are. The study thus determined the validity of the results in factor

analysis using the Kaiser- Meyer-Oklin (KMO) and Bartlett's test, which was computed.

Construct validity: construct validity is based on statistical procedures where the more significant the variance attributable to the constructs, the higher the validity of the instruments. To ensure construct validity, sample adequacy was tested in exploratory factor analysis, whereby the Kaiser-Meyer-Olkin (KMO) was used to examine sample adequacy.

Ethics are norms or standards of behavior that guide moral choices about our behavior or relationship with others (Crano & Berdie, 2016). Crano and Berdie (2016) argued that social researchers are bound to ethical considerations in their studies. Ethical consideration is an essential aspect of research issues because not all people need their elements like names to be known or shown in any place of the researcher. Therefore, the researcher observed confidentiality and anonymity to any data provided by the Iringa District Agriculture Department on the willingness of smallholder farmers to pay crop insurance in the Iringa Rural District by not disclosing them or violating any governmental policy in this study. Hence, ethical consideration was considered in all periods of the data collection process—furthermore, the researcher sought a research permit letter from the university.

PRESENTATION OF FINDINGS AND DISCUSSION

Awareness Responses

Table 1 shows that about 46 (62.9%) of the respondents indicated that they have been hearing about the presence of crop insurance. This shows that awareness has been created for farmers related to crop insurance. Despite that, little training has been conducted for small farmers since findings indicate that about 21(28.6%) confirmed that they were trained while the rest were not. Also, results suggest that despite hearing about crop insurance from various platforms, few farmers were familiar with crop insurance. This is because only 14 (19.0%) were

familiar with crop insurance, as expressed in Table 1.

Table 1: Influence of awareness

Statement	No extent at all		Small extent		Neutral extent		Large extent		Very large extent		Total (%)	
	F	%	F	%	F	%	F	%	F	%	F	%
Hearing crop insurance	7	9.5	8	10.9	12	16.4	11	15	35	47.9	73	100
Training on crop insurance	10	13.6	33	45.2	9	12.3	11	15	10	13.6	73	100
Being familiar with crop insurance	8	10.9	29	30.7	22	30.1	10	13.6	4	5.4	73	100

Source: Field data (2023).

Findings show that 62.9% of the smallholder crop farmers were aware of the existence of crop insurance; however, very few smallholder farmers were familiar with what crop insurance entails, how crop insurance schemes can be of benefit to them, and how they can access the schemes in case they are interested. The findings also showed that very few smallholder farmers, that is, only 28.6%, agreed to have been trained on crop insurance.

The findings in the quantitative part are related to the qualitative one. In interviews with key informants on the reasons behind the slow intake of Agriculture insurance, the following were mentioned: lack of awareness among smallholder farmers, high insurance premiums charged, insufficient risk coverage, and cumbersome procedures involved in joining the insurance schemes. According to Mahul and Stutely (2010), agriculture Insurance cannot work in isolation; therefore, there is a need to ensure that farmers are aware of and understand agriculture insurance as well as equip farmers with proper farming techniques to increase the farmers' income, and to get the most from it. These findings from the quantitative phase were supported by interview results conducted among agriculture officers in Kalenga, Mseke, and Isimani. The key informants asserted that quotation;

"I work in Iringa Rural District and I am aware of crop insurance schemes. According to my experience, the majority of smallholder crop farmers are unaware of crop insurance, while some of the smallholder crop farmers

may have heard of crop insurance, they are unaware of the specifics and what the insurance companies entail. We encourage insurance companies to invest in awareness among smallholder crop farmers (Agriculture Officer 1 19/7/2023).

In addition to that, one agricultural officer added:

"There are no training offered to smallholder crop farmers on crop insurance hence smallholder crop farmers are unaware and do not have a proper means of learning about crop insurance. We encourage agriculture insurance companies to invest in offering training to smallholder crop farmers who would otherwise not have access to these training and information (Agricultural Officer 2...19/7/2023).

In addition to that, one key informant asserted that.

"Smallholder crop farmers are not familiar with agriculture insurance, that is even if the farmers have heard about agriculture insurance, they are not familiar with their operations, benefits, coverage, and procedures on how to access/ join the insurance schemes. Hence this affects smallholder crop farmers' willingness to join crop insurance schemes (Agriculture officer 3...19/7/2023)".

Education Level of Respondents

To determine the influence of awareness of the use of agriculture insurance, the study assessed

respondents' education levels. The majority of respondents had a primary education level. For instance, about 50(68.4%) had a primary level education background, 10(13.6%) had a secondary level of education, 8(10.9%) had a diploma level of education, and 5(7.1%) had bachelor level of education as shown in *Table 2*.

The majority of respondents had a primary education level. Thus, awareness created for small farmers was mainly for primary education holders characterized by a low level of education and, hence, a low level of understanding and knowledgeability.

Table 2: Demographic characteristics of respondents

Respondents' Education Level (n=73)	Frequency	Per cent
Primary	50	68.4
Secondary	10	13.6
Diploma	8	10.9
First Degree	5	7.1
Total	73	100.0

Source: Field data (2023).

These findings align with a study by Torkamani (2018), who argued that a low level of education affected joining crop insurance because farmers could not capture the importance of insurance due to low education. Likewise, it was observed that it was close to joining an insurance company of not being able to justify its importance.

findings are presented in *Table 3*. The results of the correlation analysis show that awareness provision and price of crop insurance had a positive relationship towards smallholder crop farmers' willingness to join crop insurance schemes with a Pearson's correlation coefficient of $r = 669^{**}$ and that at a level of significance of 0.000, it is statistically significant at p-value less than 0.05. This result concludes that awareness creation variables positively and significantly affected smallholder crop farmers' willingness to join crop insurance schemes.

The findings also align with a study by Ellis (2017), who found that agriculture education was essential for small farmers, especially crop insurance. But despite the importance, a low level of education affected joining the insurance scheme.

These findings align with the findings by Ginder and Aslihan (2006) who found that the insurance price, lack of awareness, risk coverage, and cumbersome procedures affected smallholder crop farmers' willingness to join crop insurance schemes. Also, the findings are related to a study done by Adinolfi *et al.* (2012) on the evaluation of crop insurance in France and Italy and showed that business-related factors such as lack of awareness and high prices of insurance schemes, farm size, the number of crops grown influence the farmers' insurance decisions.

Based on this discussion, the study concludes that awareness is essential for smallholder farmers joining the crop insurance scheme. Still, it is affected by a low level of education for small farmers in the Iringa district.

Correlation Analysis

A correlation analysis was done between awareness and smallholder crop farmers' willingness to join crop insurance schemes. The

Table 3: Correlation analysis

		AWC	WJCI
AWC	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	73	
WJCI	Pearson Correlation	669 ^{**}	1
	Sig. (2-tailed)	.001	
	N	73	73

Source: Field data (2023).

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

Summary of the Study

The purpose of this study was to assess the effects of awareness creation on existing agriculture insurance schemes in Iringa Rural District, to assess the impact of insurance price on farmers' willingness to pay crop for crop insurance in Iringa Rural District, to determine the Limited Risk Coverage considered by insurance scheme in Rural District and to assess the impact of Cumbersome procedures on smallholder crop farmers' willingness to join crop insurance schemes. A descriptive research design was used for the study. The population for the study was farmers and key informants from agricultural officers in the wards of Kalenga, Mseke, and Isimani. Simple random sampling was used as the sampling technique in the quantitative part, where respondents were selected randomly. Also, the study used purposive sampling to select participants in the qualitative aspect. The study targeted 88 respondents: 73 were from the quantitative part, and 15 were from the qualitative component. Questionnaires and Interviews were used as instruments for data collection. Piloting was done to test the validity and reliability of the instruments. Quantitative data were analyzed using descriptive statistics, while qualitative data collected using interviews was analyzed thematically. Microsoft SPSS package was used to analyze the quantitative data. Descriptive statistics such as frequencies and percentages were used to analyze the data. The study found that awareness of crop insurance affects smallholder crop farmers' willingness to join insurance in the Iringa Rural District. This was evidenced by the fact that 62.9% of the respondents interviewed had lightly heard of agriculture insurance, and only 28.6% of smallholder crop farmers confirmed that they had been trained on crop insurance. This means that even though 62.9% of smallholder crop farmers had heard about crop insurance, very few farmers were willing to join due to the limited knowledge

they had received about crop insurance, its benefits, and procedures.

Conclusion

From the study, it was concluded that lack of awareness affected the willingness of smallholder farmers to join crop insurance in Iringa Rural District. While smallholder farmers may have heard about insurance, they were not familiar with what crop insurance entailed, the benefits as well as the procedures involved. This is seen to be due to the limited training offered to the smallholder crop farmers on Insurance as only 28.6% of smallholder crop farmers reported to have received training on crop insurance.

Recommendations

The following were the recommendations of the study:

The study recommends that more awareness should be created among farmers. This can be done by holding agriculture meetings with farmers to educate them on the benefits and the importance of using agriculture insurance. This will promote the uptake of agriculture insurance and the willingness to join agriculture insurance among smallholder crop farmers in the Iringa Rural District.

Recommendations for Further Research

The study was conducted in Iringa Rural District to establish the factors affecting smallholder crop farmers' willingness to join crop insurance schemes in Tanzania. The researcher, therefore, recommends that the same study be carried out in other districts and regions. The researcher further recommends that another study be done on the benefits of using agriculture insurance for farmers, which was not the focus of this study.

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