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Factors Affecting Crop Insurance Holding Intention of Farmers in Nepal

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ABSTRACT

Natural disasters such as droughts, floods, hurricanes, landslides, erratic rainfall, earthquakes, and many other climate change-related problems often affect agricultural production and farm income in Nepal. Agriculture's vulnerability to such disasters is exacerbated by epidemics and man-made disasters such as arson, spurious seed sales, fertilizers and pesticides, market crashes, etc. Such factors have exposed the higher risk to agri-business. Crop insurance is one of the main means and methods for reducing agricultural production risks. While crop insurance is one of the main risk management methods, even larger segments of farmers are outside the insurance program of the government. This may be due to many reasons such as awareness level, risk attitude, accessibility to insurance service of farmers, prevailing production risk, premium level, expected indemnity value, claim settlement process and many others. Several studies show that these factors have direct relation with the farmers' intention of holding insurance scheme. This study aims at analysing the effect of factors related to crop insurance holding intention of farmers. Data was collected from a sample of 109 farmers. Results indicated relation of risk attitude, expected indemnity & claim settlement, accessibility to insurance, awareness level. Insurance awareness has the highest relationship with the crop insurance holding intention. Similarly, insurance awareness, expected indemnity and claim settlement and risk attitude showed positive significant impact with crop insurance holding intention. Production risk and premium level and accessibility of insurance had no influence. This result implies that if awareness level of insurance is increased on farmers, their motivation toward insurance scheme can be increased. Therefore, it can be concluded that insurance program will not be successful until and unless it is supported with awareness building program and making the implementation process simpler and easy.

Keywords: *Crop insurance, agricultural insurance, farmers, agricultural production, insurance.*

INTRODUCTION

Nepal, with about one-quarter of its population living below the poverty line, is among the world's least developed countries. Agriculture continues to be extremely important in case of Nepal which contributes 24.26% to national GDP (Statista 2021) and 69% of labor force are involved in agriculture in 2017 (CIA World Factbook, 2020). Majority of the Nepalese population lives in rural areas and are depended on agriculture for their livelihood. The processing of agricultural products, including pulses, jute, sugar cane, tobacco, and grain, is mainly involved in industrial activity. The development of the nation is depending on development of the agriculture sector in the country. Agriculture is not only the source of bread and butter but a major source of raw materials to the agro-based industries in Nepal. Agriculture sector contributes more than 60% to the total national export (CBS, 2014). The country possesses 28.75 % in 2016 of agricultural land, according to the World Bank. Similarly, 29.73% in 2010 of land was agricultural irrigated land. As such, the

vast diversity in the agriculture sector also possesses great potentiality for agro-tourism in Nepal. The potentiality of agriculture is vulnerable and risky, in the perspective of agriculture cannot be taken separate from the natural environment, and the natural environment is not in the control of any individual. Agriculture is subject to exposure to the natural climate. Frequent calamities and loss due to other causes, can implicate the sustainability. Farmers must handle many forms of risk, including those inherent in crop production, marketing, financing, and human resources, to be effective. To help farmers mitigate the broad range of risks they face, several risk managements instruments and practices have been developed. An important means for controlling production risk is given by one instrument, crop insurance.

Once again, this surface irrigation is vulnerable to calamities. Cultivation in the controlled climate, i.e. in plastic houses, use of wind breaks, adoption of erosion and landslide protection mechanisms, adoption of improved flood damage mitigation practices, pricing control practices are seen to be very negligible in our context. In addition, Nepal is very inclined to a wide range of frequent cataclysms, including earthquakes, avalanches, disintegration, surges, lake episodes, ice sheets flare-up, windstorms, hail, inconsistent precipitation, due to its area in a complex seismic zone of the Himalayas (World Bank, 2009). Such events are seen more successively than some time ago because of climate change. In Nepal, about 6.4% of the national food production is lost every year due to various hazards (FAO, 2012). Food security is a major concern of the world in the context of increasing population, changing climate and declining scarce natural resources. Reducing food loss is equally important as increasing food production and productivity to feed the world, where 9.7 billion inhabitants were expected by 2050 (GC & Ghimire, 2019).

Consequently, not only do agricultural threats impact producers, but they also affect the entire value chain of agribusiness. These threats are exposed to each of the actors in the supply chain, from the suppliers of inputs to the end customer. To be effective, farmers and entrepreneurs need to manage various types of risk, including those related to development, marketing, financing and management of resources. To help farmers cope with the risks they face, farmers need to use both indigenous and modern risk management tools that have been established and created. Nepalese farmers have tried most of the practice's indigenous risk coping mechanism but could not effectively cope with the risk. The key coping strategies adopted by Nepalese farmers are changing variety, staking the crop, changing the planting time, off-farm income in agriculture, maintaining sanitation in the field, etc., but these practices are not effective in the long run. In this case, crop insurance is one of the essential instruments for coping with the risk of development. Crop insurance is a restricted tool since, because of climate, normal and natural risks, it only addresses generation and creates misfortune. Crop protection gives restricted scope to the developing yield from the season of sowing to consummation of harvest as it were (FAO, 2012).

Crop insurance is recognized as a fundamental tool for sustaining farm income stability by promoting technology, promoting investment, and growing the credit flow in the agricultural sector. The basic secret commodity security standard is that the misfortune incurred by a couple is shared among those in a zone engaged in a comparable operation. Likewise, misfortunes brought about in terrible years are repaid from assets gathered in great years (Dandekar, 1976). Not only does crop insurance insure farmers, but it can also increase access to credit for farmers, as well as promote the production of high-value crops, and there have been numerous reports of policy success across countries over the years (Syroka & Nucifora, 2010). Crop insurance contributes to farmers' self-reliance and self-respect, as they can seek

compensation as a matter of law in cases of crop loss. It thus cushions the shock of crop loss by ensuring the safety of farmers outside their reach from natural hazards. In recent years, the government of Nepal has launched a crop insurance scheme as a safety measure. The Government of Nepal and the National Insurance Board inaugurated the Crop and Livestock Insurance Directive on 1st January 2013, acknowledging the value of crop insurance as an instrument for managing risk and uncertainty in agriculture (MoAD, 2013). Multi-peril insurance scheme is the only insurance scheme which is currently in use in Nepal. The agriculture (crop and livestock) insurance in Nepal has increased by 17.61% in the 2019-20, non- life insurance companies have collected premium of Rs. 1.18 billion from agricultural insurance. The government provides 75% of the premium amount as the subsidy for agricultural insurance (Investopaper, 2020). Despite this, Nepal faces a range of main administrative, technological, operational, and financial challenges in implementing products and services for crop and livestock insurance. The insurance scheme has still not been able to cover enough of the country's small and marginal farmers.

The number of insurance agents and the proper marketing of agricultural insurance in remote areas is limited, and there is limited knowledge among stakeholders of the implementation and benefits of government agricultural insurance schemes. The small presence of insurance companies in remote areas indicates that insurance companies are not sufficiently inspired by the government's agricultural insurance policy. The reason behind the fact may be due to limited benefits and high cost of transaction in agriculture. In other side, farmers are viewing the current premium rates for agricultural insurance to be high. Especially in crop sector, farmers generally see the indemnity value based on the cost of production is unfair unlike the livestock sector.

With this background this study focused to analyze the factor affecting crop insurance holding decision of the farmers or producers in Nepal from the perspective of the farmers.

INSIGHTS OF CROP INSURANCE – A LITERATURE VIEW

***Concept of crop insurance*:** Created over 200 years ago, crop insurance has been used for a long time (Smith & Glauber, 2012). It started out as private insurance funds offering cover for livestock and threats, such as hail insurance. Although crop insurance has been available for a long time, it has primarily been used in developing countries. There is a plethora of literature in the field of agricultural insurance. Crop insurance refers to insurance that offers financial coverage for production or sales losses, according to Mahul and Stutley (2010).

Susceptibility of agriculture to these disasters is compounded by the outbreak of epidemics and manmade disasters such as fire, sale of spurious seeds, fertilizers and pesticides, price crashes etc (Mohammed & Ortmann, 2005*)*. Crop insurance is one of the main means and methods for reducing agricultural production risks. Crop insurance policies help to reduce the risks and vulnerabilities of poor rural smallholder farmers and to open up access to a variety of risk management financial services. Due to apparent sudden changes in climatic conditions resulting in large-scale damage to the production system, crop insurance has gained greater significance in recent years in Nepal. In Nepal, climate fluctuations such as rising temperatures, erratic monsoons, and changes in rainfall intensity and pattern have significantly affected the agricultural sector (Ghimire et al., 2010). To ensure that climate change adaptation strategies are tailored to address vulnerability, Fisher & Surminski (2012) stated the value of the public and private sectors. The introduction of crop insurance is most effective and

handled efficiently when the private commercial agricultural sector is active in any way (Mahul and Stutley, 2010).

Senaye Araya (2011) also urged the private sector's importance in developing insurance products for smallholders. Considering the regulation and insurance of natural disasters in the light of climate change poses another critical issue: the question of insurability. Some experts warn that risks in the future can become uninsurable (Charpentier, 2008; Herweijer et al., 2009); others argue that there are some strong opportunities for the insurance industry to develop new products (Mills 2009). The innovative products with public private partnership modalities would be options for promoting crop insurance program (Prakash and Sharma, 2014). The importance of connecting risk transfer to risk reduction, which could be an attempt to resolve the insurance dilemma of increasing risk levels, is one main factor emerging in this context (Ward et al. 2008). Crop insurance is seen as one of the best methods for addressing farm risks and motivating farmers to follow new production practices with greater potential for higher and better-quality yields (Olubiyo et al., 2009). It can play an important role to reduce risks of farming particularly that are affected by climate induced production losses.

Insurance policies in the agricultural sector are quite similar to any other insurance (Smith & Glauber, 2012). The insurance provisions in a country are a function based on the state´s willingness to subsidize (Raviv, 1979). The selection of agricultural policies can be divided into three groups in developed countries. Unique or named hazardous products: insurance that is common in Western Europe and Sweden covers damage caused by a particular danger, such as hail or fire, and is sold primarily by private companies (Raviv, 1979).

***Antecedents of crop insurance decision*:** Several studies have been conducted on variables affecting the decision of farmers to use crop insurance. One of the prevailing antecedents for crop insurance is the possible danger in agriculture. Agriculture risk is a negative outcome that results from imperfectly predictable biological factors such as disease and pest outbreaks, price risk, input unavailability called resource risk and adverse climatic factors such as droughts, floods, storms, etc., which are beyond the control of the farmer (Mani et al., 2012). Risk has historically been defined as development risk, financial risk, business risk and systemic risk in the agricultural sector (Boehljr, Gray, & Detre 2005). Climate change is adding more risk in Nepalese agriculture (Gautam & Pokhrel, 2010). Phuyal (2013) in his study of climate change vulnerability, impacts and adaption of agriculture in a mountain region of western Nepal. Synnot (2012), current adaptation strategies adopted by Nepal's farmers have been established and potential future adaptation strategies have been put forward. Vulnerable households often respond to food insecurity by missing meals, harvesting wild plants, reducing food intake, depending on food aid, selling assets such as livestock and changing sanitation practices. In rural areas, temporary relocation and permanent resettlement have also become traditional coping strategies adopted by farmers. Manandhar, Vogt, Perret, and Kazma (2010) conducted a case study on Nepal's Adapting Cropping Method to Climate Change: a cross-regional survey of the perception of farmers through reconnaissance surveys. The study found that the lowland farmers used the indigenous information system there for weather forecasting. Most farmers have switched from local to modern hybrid varieties to early maturing and less water requiring and flood resistant varieties in order to change the climate risk of drought, flood and late rainfall. They have also turned towards innovations for soil conservation, such as zero tillage and surface sale. Farmers have also begun off-farm operations, such as serving as porters and seasonal employment in other sectors.

The scope of coping strategies for climate change is a popular topic in the past two decades (Deressa et al., 2009; DiFalco &Veroneisi, 2013) globally. World Bank (2011) reported informal approaches are much more frequently found at the farmer level in developing countries. They include savings, household buffer stocks and community savings. Crop diversification, intercropping, and flexible input use are the best-known practices to reduce production risk.

Guo (2016) research in Nepal revealed that individuals with higher bids are less likely to receive insurance. The perception of climate change and the payoff of insurance are other factors influencing the decision on crop insurance. Bharati et al. (2014) also showed that age, education and class contributed significantly to crop insurance adoption. Age, the most significant adoption factor, contributed to adoption by about 50 percent. Younger farmers with larger land holdings have been shown to have more crop insurance. It was also observed that the rate of adoption increased with the increase in bank branches. In the study of Yasmin and Hazarika (2015) in Assam rural district, India found that the insurance decisions of farmers were positively affected by factors such as the size of farmers' landholding, access to loans, age, education achievement, access to non-farm income and access to irrigation. Karthick and Mani (2013) research in Tamil Nadu, India found that the significant determinant of crop insurance was the age of the farmer, access to credit, and education of the farmer. The other factor responsible for adopting crop insurance was the lack of crop diversification and concern among farmers about a sure loss of income. Ghazanfar et al., (2015) study in Pakistan shows that most farmers perceived that crop insurance schemes were not very helpful because the compensation provided was not satisfactory and the farmers declared it to be the most significant perception. Demand for area crop insurance among litchi producers in northern Vietnam was investigated in the study conducted by Vandeveer (2000), by developing hypothetical insurance programs that proposed all risk coverage based on area yields. It was found that farmers were not receptive to the premium change, with higher-income farmers more likely to participate. The level of yield guarantee also tends to positively influence the actions of farmers towards insurance. The insurance is more likely to be accepted by farmers who have experienced more litchi failure, but other farmers' characteristics seemed to matter little. That means the farmers accept insurance in the context of crop failure experience.

Similarly, Sherrick, Barry, Ellinger and Schnitkey (2004) discovered that market variables and personal factors affect the risk and ability of the farmer to have insurance. The findings indicate that for older, less-tenured, bigger, highly leveraged farms and farmers who perceive a higher degree of yield risk, the probability of using crop insurance is greater. That is, the amount of insurance depends on the farmers risk preferences. The choice of buying insurance often depends on the amount of premium, estimated compensation, level of risk and the availability of alternative risk management tools (Makki & Somwaru, 2001). A study by Ginder and Aslihan (2006) shows that the price of insurance is the most important factor that decides whether farmers decide to have insurance and what form of insurance plan is selected. A research by Enjolras et al. (2012) analyses crop insurance in France and Italy and shows that environmental conditions have less effect on the insurance choices of farmers. They find that business-related variables such as the size of the farm, the number of crops grown, and the premium levels affect the insurance decisions of farmers. Similarly, the option was based on the anticipated structure of utility. Smith and Baquet (1996) assess the market in Montana for multiple risk crop insurance for wheat farming. They found that the premium levels, high level of debt use,

projected yield and perceived yield risk affected the decision on crop insurance by using the expected utility theory.

A study in Northern Illinois, Ginder and Spaulding (2006) study found that farmers were not affected by another group when making their decision to buy crop insurance. This was also true of the risk taker category. However, a crop insurance provider was as likely to control the risk averse community as it was to independently make the decision. When the ranked price was the first consideration, the insurance seemed to be much more embraced by risk averse farmers. The other group of factors showed that government subsidization of premium and weather issues was highly important to survey participants. In the research on cocoa insurance in Nigeria by Falola et al. (2013), it was found that the availability of agricultural extension services was a beneficial factor for insurance. Ramasubramanian (2012) studied weather insurance covering all crops, taking India as a case study to confirm that more risk-averse individuals were more likely to buy the product, which was contrary to the findings in the rural India study by Gine et al. (2008).

Goudappa et al., (2012) found that bank compulsion was the motivation for opting insurance. Financial security, good experience from others was the region for opting crop insurance. In Australia, Meuwissen and Molnar (2010) found that farmers consider the risk of commodity prices as more important than climate risk. They also view risk management instruments such as water management and diversification as more relevant than the purchase of crop insurance. Chikaire et al. (2016) identified that agricultural insurance, in exchange for payment of regular premiums proportionate to the probability and expense of the risk involved, aims to provide inadequate cover against particular risks. Although security against the elements is a big part of taking out insurance, once they know their commodity is protected, farmers reap a multitude of benefits.

Nevertheless, crop insurance in Nepal was only introduced in 2013, and crop insurance is an entirely new field of research in Nepal. In the field of crop insurance in the country, there are many dimensions still to be explored. The feasibility of the program and significant numbers of farmers are still not protected. The factors influencing farmers' willingness to participate in the insurance program should be analyzed in this context. In this respect, there are very few studies carried out that try to find out the reasons behind the lower farmers' coverage under this scheme. To make the insurance program successful, the perception and attitude of farmers towards the various aspects of agricultural insurance is important. In the local context, there is almost no research performed focused on psychological study. Therefore, this study aims to concentrate on finding the variables that influence the decision-making of farmers' insurance holdings.

Base on the review of the previous studies, this study considered production risk, premium level, expected indemnity and claim settlement, insurance awareness and accessibility of the insurance and risk attitude as the predictors to insurance holding intention of the farmers.

METHODS

This study adopted a quantitative research approach focused on the information given by farmers, introducing it to the nature of descriptive and explanatory research. The study was carried out in Mahankal Village Council under the Lalitpur District Coordination Committee, Province 3 of Nepal, 45 km away from Kathmandu City. A sample of 109 farmers was considered for the study. The data were collected through personal visit, household survey and informal group discussion. As most people are engaged in agriculture and farmers have taken crop insurance, the district has been chosen purposely. The

primary source of data with structured questionnaires was considered. The questionnaire mainly included multiple choice questions and 6-point Likert scale 25 statements representing exogenous and endogenous variables in 'Strongly Disagree' (1) to 'Strongly Agree' (6). A pilot testing was conducted with 20 samples and with few modifications the questionnaire was finalized. The reliability analysis was done by Cronbach's alpha, which was above 0.7 alpha value. The overall Cronbach's alpha was 0.789 (25 items), likewise, the individual Cronbach's alpha related to variables were -Production Risk =0.721 (4 items), Premium Level =0.775 (3 items), Expected Indemnity and Claim Settlement=0.834 (5 items), Risk Attitude/ Exposure =0.801 (4 items), Accessibility of Insurance =0.715 (4 items), Insurance Awareness =0.762 (2 items), and Insurance holding intention =0.808 (3 items). It processed and tabulated the collected data. For the study, various descriptive and inferential statistics were used. Descriptive statistics were used to summarize the variables and to define the study area. The mean and standard calculations were performed in descriptive statistics; correlation analysis and regression analysis were carried out for inferential analysis. During data analysis SPSS v24 was used.

Respondents' profile

The respondent profile includes age, education level, higher level of education of family member, ethnicity, family size, off farm income, loan taken for agriculture purpose, knowledge of crop insurance, holding crop insurance, family member involved in groups/cooperative and thinking, land holding for farming, and perception on agriculture business is risky.

Out of the 109 respondents minimum age was 22 years to maximum of 70 years. It shows in Nepalese farming, people of different age groups are involved. The educational qualification shows that 60 percent of the respondents were upto SLC level (secondary level), 20 percent of the respondents were intermediate level, 11 percent were bachelor's level and 4 percent were in master's Level. Most respondents have Primary level of education as the distribution shows that 71 respondents were below SLC. So, this result shows that most respondents have lower education level. The highest educational level of the respondents' family member shows that 28 percent of the respondents were in SLC level, 37 percent were in the intermediate level, 29 percent were in bachelor's level and 9 percent were in master's level or above. Most respondents have intermediate level as highest level of education in their family members as the distribution shows that 40 respondents were between intermediate level.

Likewise, 85.3 percentages of the respondents are Bahun and Chhetri, 11.9% of the respondents belongs to indigenous group and only 2.8 percentages belong to Dalit group. Hence, this result shows that most of the respondents belong to Bahun and Chhetri. The family size of the respondents was from 3 to 13 members. Among the respondents most of them had the family members between 4 to 6. Among all the respondent 52 % of the farmers have very less i.e. from 0-10 % of off farm income. Most of the farmers are solely dependent on the crop business. Out of 109 respondents, 84.4% farmers have taken loan for their business whereas, 15.6% of them had not used any sort of loan. It is seen that many farmers require agriculture loan. Similarly, out of them 84% had the update knowledge of the available crop insurance whereas 15.6% did not have update knowledge of crop insurance. The 55% of the farmers have taken the crop insurance whereas 45% were not taken crop insurance. In similar manner, almost all the farmer's family members are involved in groups and cooperative that exist in the society. Involvement in the groups and cooperative makes the people understand the financial effect in their family business.

Likewise, most of the farmers had small holding lands for agriculture 86.24%,

and large holding are with 13.76% farmers. Further, 99.1% perceived that agricultural business is of risk.

Table 1: ***Respondents profile***

Educational Qualification	**Frequency**	**Percentage**
Up to SLC	71	65.14
Intermediate	22	20.18
Bachelor's degree	12	11.01
Master's degree or above	4	3.67
Highest Qualification of Family Member	**Frequency**	**Percentage**
SLC	30	28%
Intermediate	40	37%
Bachelor's degree	29	27%
Master's degree or above	10	9%
Ethnicity	**Frequency**	**Percentage**
Indigenous Nationality	13	11.9
Dalit	3	2.8
Bahun/Chhetri	93	85.3
Family Size	**Frequency**	**Percent**
3	8	7.3
4	23	21.1
5	25	22.9
6	23	21.1
7	15	13.8
8	10	9.2
9	2	1.8
10	2	1.8
13	1	0.9
Off-farm Income	**Frequency**	**Percent**
0 -10	57	52.3
20-30	19	17.4
21-30	11	10.1
31-40	9	8.3
41-50	6	5.5
51-60	6	5.5
61-70	1	0.9
Agricultural loan taken	**Frequency**	**Percent**
Yes	75	68.8
No	34	31.2
Update knowledge on Crop Insurance	**Frequency**	**Percent**
Yes	92	84.4
No	17	15.6
Crop insurance holding	**Frequency**	**Percent**
Yes	60	55%
No	49	45%
Family Member Involved in Group or Cooperative	**Frequency**	**Percent**
Yes	106	97.2
No	3	2.8
Land holding for framing	**Frequency**	**Percent**
Small holdings	94	86.24
Large holdings	15	13.76
Perception on risk in agriculture business	**Frequency**	**Percent**
Yes	108	99.1
No	1	0.9
Age of the respondents	**Min-Max**	**Mean (SD)**
Age in years	22-70	40.3 (10.459)

RESULTS

Production risk in the crop business is one of the factors for insurance holding intention, the results There were four statements used to measure the production risk in crop business, the mean value show that 4.77 to 5.20 i.e., the response are in agreeableness. The mean value for production risk was M=5.04, SD= 0.557, shows that the farmers give importance to production risk. The respondents stated that crop insurance will cover all the risks on crop production, and they perceive that my production is risky. It means that the farmers believe that the crop is a risky business and should think of the crop insurance.

Likewise, premium level is another factor considered. There are three statements used to measure the premium level in crop business. The results show the items have a mean value ranging from 4.78 to 4.96 i.e. the response is slightly agreeableness. The aggregate mean of premium level was M=4.85, SD=0.909. This shows that the farmers due concerns to premium level while considering for insurance holding decision. The farmers states that the 75% subsidy on premium level given by the government is reasonable for the farmers and the crop insurance premium amount is reasonable for them. They show their concern towards the payment of premium in one instalment is conducive and reasonable for me. It means that the farmers do not feel that the payment of premium amount in one instalment is reasonable.

Similarly, the expected indemnity and claim settlement factor have five statements used to measure this factor. The result show that the items have a mean value ranging from 4.11 to 5.96 i.e. the response is agreeable side. The mean of expected indemnity and claim settlement was M=5.19, SD=0.485. This shows that the farmers are inclined to consider the expected indemnity and claim settlement for crop insurance holding decision. The farmers stated that they are satisfied with the level of compensation provided by the insurance company on the loss of their crop. The insurance company provides compensation about 90% of the loss on cost

of production. However, they brought the concerns of believing that the claim settlement is made on time. It means that the farmers do not feel that the process of claim settlement procedure is easy.

Risk attitude is another factor considered with four statements used to measure the risk attitude of the farmer. The mean of risk attitude is M=5.58, SD=0.385, this shows that the farmers are more concerns to the risk attached with agriculture for crop insurance holding decision. The farmers stated that the crop insurance is an important risk management tool in their crop production. In addition, they prefer to acquire sustainable gains by avoiding losses in their farm. It means that the farmers are not willing to take risk to increase their level of production. This shows that the farmers are more risk averse than risk taker. The willingness factor is also implicated by the accessibility of insurance, which was another variable in consideration in the research. Four statements used to measure the accessibility of insurance of the farmer. The results show that the items have a mean value ranging from 4.06 to 4.91 i.e. the response was towards slightly agreeableness. The aggregate mean of accessibility of insurance was M=4.33, SD=0.869. This shows that the farmers are concerned of the accessibility of insurance at hive and it has a relationship with the insurance holding decision. The farmers stated that the process of getting the crop insurance is very easy. However, they have concerned of having direct reach with the crop insurance company/ agents. It means that the farmers believe that they do not have direct reach with the crop insurance company and agents.

Likewise, insurance awareness is another factor considered for this research. There were two statements used to measure the insurance awareness of the farmer. The results show that the items have a mean value of 4.84 and 5.74 i.e. the response is agreeableness. The aggregate mean of insurance awareness was M=5.29, SD=0.733. This shows that the farmers give importance insurance awareness with the insurance holding decision. The farmers stated that they were well aware of the crop insurance provisions provided by insurance companies. However, they showed a concern on they have faith on insurance company for insuring my crop insurance. Finally, the farmers' perception towards crop insurance holding intention was measured. Three statements were used to measure the Insurance Holding Decision of the farmer. The result shows that the items have a mean value ranging from 5.56 to 5.74 i.e. the response is positive. The aggregate mean of crop insurance holding intention, M=5.66, SD=0.571. This shows that the farmers have positive towards the crop insurance holding Intention as they strongly agreed to the holding. The farmers feel it is important to hold crop insurance, they will continue holding the crop insurance and recommend the crop insurance to the fellow farmers.

Table 2: ***Descriptive statistics of factors of insurance holding intention of farmers***

Factors	Mean	SD	Result in 6-point Likert Scale
Production Risk	5.04	0.557	Agree
Premium Level	4.85	0.909	Slightly Agree
Expected Indemnity and Claim Settlement	5.19	0.485	Agree
Risk Attitude	5.58	0.385	Strongly Agree
Accessibility of Insurance	4.33	0.869	Slightly Agree
Insurance Awareness	5.29	0.733	Agree
Crop Insurance Holding Intention	5.66	0.571	Strongly Agree

Relationship of factors related to crop insurance holding intention

Correlations analyses between variables were studied to find relationship among them. Pearson's correlations analysis was carried out for variables and the correlation matrix is presented in table 3. The correlation analysis results show a positive relationship of Expected Indemnity and Claim Settlement, Risk Attitude, Accessibility of Insurance and Awareness towards Crop Insurance Holding Decision. Whereas the result indicates that the Production risk and Premium Level had not relationship with the Crop Insurance Holding Decision in this study.

The result shows that Expected Indemnity and Claim Settlement and Crop Insurance Holding Decision has (r) 0.557, p value (0.001)<.0.01 which implies that the two variables are strong positively correlated. Similarly, Risk Attitude and Crop Insurance Holding Decision has (r) 0.425, p value (0.001)<.0.01, which implies that the two variables are moderate positively correlated. Likewise, Accessibility of Insurance and Crop Insurance Holding Decision has (r) 0.322, p value (0.001)<.0.01, which implies that the two variables are moderate positively correlated. Further, Accessibility of Insurance and Crop Insurance Holding Decision has (r) 0.696, p value (0.001)<.0.01, which implies that the two variables are strong positively correlated. The correlation was significant at 1% significant level for all related variables. The highest relationship was seen in Insurance Awareness, followed by Expected Indemnity & Claim Settlement, Risk Attitude and Accessibility of Insurance.

Whereas, Production risk and Crop Insurance Holding Decision has (r) 0.173, p value (0.071)>0.01, which implies that there does not exist any significant relation between these variables. Similarly, Premium Level and Crop Insurance Holding Decision has (r) 0.185, p value (0.053)>0.01, which implies that there does not exist any significant relation between these variables of production risk and insurance holding intention.

Table 3: ***Correlation analysis of factors related to crop insurance holding intention.***

Factors	Crop Insurance Holding Intention
Production Risk	r=0.173
	p=0.071
Premium Level	r=0.185
	p=0.053
Expected Indemnity & Claim Settlement	r=0.557**
	p=.001
Risk Attitude	r=0.425**
	p=.001
Accessibility of Insurance	r=0.322**
	p=.001
Insurance Awareness	r=0.696**
	p=.001

***. Correlation is significant at the 0.01 level (2-tailed).*

Impact of considered factors to crop insurance holding intention

This section describes which independent variable explains the outcome variability, how much variability is explained by independent variables and dependent variable in the dependent variable, and which variables are important in explaining the dependent variable variability (among other variables). Multiple regression was used to analyse the effect on dependent variable of independent variables (Production Risk, Premium Level, Anticipated Indemnity & Claim Settlement, Risk Attitude, Insurance Accessibility, Insurance Awareness) (Crop Insurance Holding Intention).

Table 4: ***Regression analysis***

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.09	0.682		0.132	0.895
Production risk	0.068	0.069	0.066	0.99	0.325
Premium level	0.006	0.044	0.01	0.14	0.889
Expected indemnity and claim settlement	0.313	0.09	0.266	3.482	0.001
Risk attitude	0.279	0.108	0.188	2.582	0.011
Accessibility of insurance	0.005	0.049	0.007	0.098	0.922
Insurance Awareness	0.385	0.06	0.494	6.411	0.000
R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
.763[a]	0.582	0.558	0.379	23.711	.000[a]

Model summary indicates the R-square also known as coefficient of determination which can help in explaining variance. The value of R-square value was 0.582 which means 58.2% variation in Crop Insurance Holding Intention is explained by Production Risk, Premium Level, Expected Indemnity & Claim Settlement, Risk Attitude, Accessibility of Insurance and Insurance Awareness. However, the remaining 41.8% (100% - 58.2%) is still unexplained in this research. In other words,

there are other additional variables of insurance holding intention that have not been considered in this research. Similarly, adjusted R-square is 0.558 which means 55.80% variation in Crop Insurance Holding Intention is explained by Production Risk, Premium Level, Expected Indemnity & Claim Settlement, Risk Attitude, Accessibility of Insurance, Insurance Awareness after adjusting degree of freedom (df). The F value is significant; the p-value is 0.001 which is lesser than alpha value 0.01. Therefore, the model is a good predictor model. Taking six dimensions of i.e. Production Risk, Premium Level, Expected Indemnity & Claim Settlement, Risk Attitude, Accessibility of Insurance, Insurance Awareness as independent variable (X1, X2, X3, X4, X5, X6) and Insurance Holding Intention as the dependent variable, the model is constructed with equation as:

$$\hat{Y} = \alpha + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \beta 5X5 + \beta 6X6 + ei.$$

Where,
Ŷ *= Insurance Holding Intention (Dependent Variable)*
X1 *= Production Risk*
X2 *= Premium Level*
X3 *= Expected Indemnity & Claim Settlement*
X4 *= Risk Attitude*
X5 *= Accessibility of Insurance*
X6 *= Insurance Awareness*
α *= Constant*
βi *= Coefficient of slope of regression model*
ei *= Error term*

Based on the coefficients, the regression equation for the insurance holding intention can be written as:

$$\hat{Y} = 0.90 + 0.068X1 + 0.006X2 + 0.313X3 + 0.279X4 - 0.005\ X5 + 0.385X6$$

Regression coefficient of Production Risk, Premium Level, Expected Indemnity & Claim Settlement, Risk Attitude, Accessibility of Insurance, Insurance Awareness as independent variable are 0.068, 0.006, 0.313, 0.279, 0.005 and 0.385 respectively.

The regression analysis shows that Expected Indemnity and Claim Settlement, Risk Attitude and Insurance Awareness are the significant independent variables while the other three independent variables i.e., Production Risk, Premium Level, Accessibility of Insurance, as independent variable have non-significant results since their respective p-values are greater than ($p > 0.05$). This illustrates that 1 unit increase in Expected Indemnity & Claim Settlement, Risk Attitude, Insurance Awareness will bring 0.313, 0.279, and 0.385 increases respectively in Insurance Holding Intention. Expected indemnity and claim settlement has a standardized Beta of 0.266, Risk attitude has a standardized Beta of 0.188, and Insurance Awareness standardized Betta of 0.494. Since, the Beta of Insurance Awareness is high among them, it can be said to have the most dominant influence in increasing Crop Insurance Holding Intention.

DISCUSSION

The relationship of different factors affecting the purpose of crop insurance is mainly discussed in this section. Production risk, premium level, expected indemnity and claim settlement, risk attitude/exposure, insurance accessibility, insurance awareness were the key factors. In the local context of Nepal, social science research on the relationship of different factors with the purpose of crop insurance has hardly been conducted. This study was therefore done to illustrate the local problems of crop insurance.

The main objective of the analysis was to examine the variables that influence the farmers 'crop insurance intentions. In essence, the different statements relating to six thematic factors relating to the intention of keeping crop insurance were examined by farmers in relation to their views on the intention of taking crop insurance.

A survey was therefore carried out to examine the impact of the various independent variables considered in the research (production risk, premium level, expected indemnity and claim settlement, risk attitude/exposure, insurance accessibility, insurance awareness) on the farmers' intended crop insurance. The study was performed with a sample size of 109 farmers, including both holders of crop insurance and non-holders. The research based on the Lalitpur district of Mahankal Village Council in Nepal.

The results show that the risk attitude was highest among the variables, suggesting that most farmers are risk averters. They don't want to take the opportunity as soon as possible. This indicates that farmers want to avoid the potential market danger and the potential crop insurance attraction. Similarly, when it comes to holding insurance, it means that most farmers have a strong intention of holding crop insurance. This finding supports the notion of Mani et al., 2012 who stated about agriculture risk, and risk has historically been defined as development risk, financial risk, business risk and systemic risk in the agricultural sector (Boehljr, Gray, & Detre 2005). Fisher & Surminski (2012) and Mahul and Stutley (2010), who stated the value of the public and private sectors. The introduction of crop insurance is most effective and handled efficiently when the private commercial agricultural sector is active in any way (Mahul and Stutley, 2010). In this concern, Senaye Araya (2011) also urged the private sector's importance in developing insurance products for smallholders. The Charpentier (2008) Herweijer et al. (2009), who warn that risks will become uninsurable in the future, is little refuted by this finding; nevertheless, Mills (2009) claims that there are some good opportunities to create new products for the insurance industry. Similarly, this is aligned with the importance of connecting risk transfer to risk reduction as stated by Ward et al. (2008). There may, however, be numerous barriers that may prevent them from obtaining crop insurance. Falola et al. (2013), it was found that the availability of agricultural extension services was a beneficial factor for insurance.

This study found that only four variables viz. Expected Indemnity & Claim Settlement, Risk Attitude, Accessibility of Insurance, Insurance Awareness were found to be statistically significant relationship. Highest correlation was found of insurance awareness. This indicates that the greater purpose of keeping crop insurance is generated by knowledge of crop insurance among farmers. It is related with the findings of the Mani et al., 2012, the choice to purchase insurance also depends on the premium level, expected indemnity, risk level and availability of alternative risk management tools (Makki & Somwaru, 2001). It supports the study findings Baquet (1996) who found that projected yield and perceived yield risk affected the decision on crop insurance by using the expected utility theory. In regards of the accessibility of insurance it supports the study of Falola et al. (2013), where it was found that the availability of agricultural extension services was a beneficial factor for insurance.

Similarly, it supports the study of Guo (2016) which revealed that individuals with higher bids are less likely to receive insurance. The perception of climate change and the payoff of insurance are other factors influencing the decision on crop insurance. A study made by Ginder and Aslihan (2006) shows that the price of the insurance is the most influential factor determining the farmers decision to have insurance or not and what type of insurance product that is chosen. Sherrick, Barry, Ellinger and Schnitkey (2004) evaluate the demand for crop insurance in their study “Factors’ influencing farmers’ crop insurance decisions. The study also shows that the level of insurance depends on the farmers risk preferences. The likelihood for using crop insurance was seen higher in farmers that perceive higher level of yield risk.

The impact analysis shown that among the six factors, insurance awareness, expected indemnity & claim settlement and risk attitude were found having impact on intention of holding crop insurance. This finding is aligned with that of Vandeveer (2000), in which it was found that farmers were not receptive to the premium change, with higher-income farmers more likely to participate, but see the indemnity. The level of yield guarantee also tends to positively influence the actions of farmers towards insurance. Ramasubramanian (2012) studied the weather insurance with coverage of all crops, taking India as a case study. The author also confirmed that more risk-averse people were more likely to purchase the product, which was opposite to the results in (Gine et al., 2008)'s study in Rural India. Likewise, the notion of insurance awareness was similar to the findings of Bharati et al. (2014) and Yasmin and Hazarika (2015), in which it was showed that education and awareness and class contributed significantly to crop insurance adoption. However, it failed to support Smith and Baquet (1996) who found that the premium levels affected the decision on crop insurance by using the expected utility theory.

CONCLUSION

The basic purpose of this study is to examine the relationship between the various factors relevant to the farmers in Nepal's crop insurance policy and insurance holding intentions. The results show a very important aspect of insurance policy in the agricultural sector, especially in the field of crops. Insurance is considered an essential risk management tool for farm businesses, and its growth is slowly penetrating in our region.

The results of the current study would be very useful for policy makers to expand the insurance program. The study shows the direct relationship of farmers' insurance holding intentions with various variables such as production risk, premium cost, anticipated pay-out and claim settlement, risk attitude/exposure, insurance accessibility. The research, however, illustrates the important positive relationship between insurance accessibility, risk attitude/exposure and planned pay-out and claim settlement with farmers' insurance holding intentions. The most fundamental aspect of the expansion of the insurance program is the awareness of farmers on the insurance program, premium level and value of insurance in farm sector, settlement process and various provisions. Farmers remain hesitant to pursue an insurance scheme without knowledge of this essential detail. Knowledge of insurance is one of the main factors in convincing farmers to buy a crop insurance policy. Another element of the insurance scheme is how it is applied in the field of agriculture. The basic aspects of the implementation process are the method of buying the insurance policy, its registration process, the amount of coverage (indemnity amount) and form, damage assessment process, the timely claim resolution process. They would not be included in the insurance scheme if these procedures are complex and farmers feel difficult.

In this respect, this study clearly demonstrates that the planned mechanism of compensation and claim resolution, including other items, has a strong impact on encouraging farmers to buy insurance policies. To attract more and more customers, the companies involved should make any insurance policy procedure easy and fair (farmers & agribusinesses). Equally, the farmers' risk attitude suggests that farm business is full of risks and problems that annoy farmers to stay in the group. It can be concluded that they appear to have insurance plans for their farm business due to the risk-adverse aspect of the farmers. Thus, the policy maker and implementer should focus on these factors of insurance to make the insurance program more effective and client friendly.

Further research implications

In Nepal, crop insurance is an entirely new field of study. It has been almost five years since the government introduced the BS crop insurance scheme in 2069. In the virgin area of crop insurance, there are many things yet to be discovered. This research aimed to concentrate only on defining the variables that influence the decision-making of farmers' insurance holdings. The variables used were various aspects of insurance and the study was focused on the farmer's view and attitude towards crop insurance.

Since the analysis was based on a small sample size and is the only case study, this can be repeated to a wider region for a more representative result with a larger sample. The following guidelines are recommended to act as a guideline for potential research work of a similar nature, based on the research results of this report. This analysis focused only on the quantitative method, so further study for more reliability should be carried out on a subjective basis. This study was only conducted in the agricultural crop field, and the greater part of agriculture is still in the livestock sector. Therefore, livestock insurance should also be tested for a more representative outcome. This research focuses only on the consumer aspect (User), the respective study on the level of the service provider will also be relevant to get the idea on supplier side issues. In addition to the effect of incentives on consumers, the influence of the government's insurance policy program may also be of interest to the report.

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