

Farmers' perception and awareness towards agriculture insurance as a tool of risk management in Kaski and Chitwan Districts of Nepal

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Abstract

This study aims to assess farmers' awareness and perception towards agriculture risk management and insurance in Nepal's Kaski and Chitwan districts. Despite agriculture being the primary occupation for more than 60% of the population, the contribution of agriculture to GDP remains at 23%. Agriculture insurance is a new concept in Nepal, and the growth of the insurance market has been unimpressive over the past twelve years. The study's sample consists of existing agriculture insurance policyholders who have received or are in the process of receiving claims. Data was collected using a structured questionnaire from 200 respondents in Bharatpur and 200 respondents in Pokhara Metropolitan city, with a five-point Likert scale measuring awareness and perception. Results suggest that farmers are generally aware of the risks associated with agriculture and perceive insurance to be a useful scheme. Trust between farmers and insurance companies is deemed essential for insurance to succeed. Economic and claims-related factors were found to be more influential than family size and education, while the sex and age of respondents were insignificant. The study implies that while insured and claim-recipient farmers have a fair awareness of agriculture insurance, they lack traditional risk management techniques.

Key Words: Awareness, Agriculture Insurance, Perception, Risk Management.

I. Introduction

Agricultural Risk Management (ARM) is an innovative approach for improving the resilience of vulnerable rural households and leveraging finance and investment. Risk management is crucial in the investment and financing decisions of farmers in developing countries and

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transition economies (FAO, 2005). Earliest farmers have developed measures to limit these risks like crop rotation and diversification, inter-cropping, use of low-yield but hardy varieties, tillage systems, share tenancy, contractual inter-linking, and development of non-farm sources of Income (UNCTAD, 1994).

Agriculture producers often use different risk management strategies because it is a precarious sector (Rahman et al., 2022). Usually, the major risks producers' faces are categorized into five forms: production, marketing, financial, human capital and environmental risk (Velandia et al., 2009).

A growing body of evidence shows that climate change is set to increase the frequency and intensity of natural hazards. UN (2007) asserts a global increase of 87% in hydro-meteorological hazards (such as droughts, floods and hurricanes) in the last 20 years. Livestock and poultry are facing various types of infectious diseases such as Foot and Mouth Disease, Paste des Petits Ruminants, hemorrhagic septicemia, black quarter, swine fever, avian influenza, and Newcastle disease (Poudel et al., 2020). In addition, because of the out-migration of young people, there is a high shortage of agricultural labour, resulting in a manifold increase in labour cost, so farmers are reluctant to engage in agriculture and divert their profession to other areas. In this context, insurance in agriculture with enough subsidies seems necessary to attract people to the agriculture sector.

Nearly 61% of the population is engaged in farming, and almost all households keep any livestock (cattle, pig, poultry or fishery) in Nepal (NLSS, 2018). The majority of the farmers have experienced the loss of their crops due to natural calamities (drought, cyclone, heavy rainfall, flood, snowfall, landslide, short span of life etc.) and artificial problems (use of more pesticides, spurious seed and price changes, the issue of market access). A World Bank report (2005) ranked Nepal 4th in climate risk and 11th in earthquake vulnerability.

Agriculture insurance in Nepal

Nepalese farmers have used indigenous risk management techniques to cope with agriculture risks (Chaudhary et al., 2021). The World Bank (2009) suggested that the Government of Nepal need to implement agricultural insurance (AI) in Nepal. Crops and Livestock Insurance service was initiated in joint collaboration with the Ministry of Agriculture, the Insurance regulatory authority and nonlife insurance companies in 2013. However, livestock insurance service was practised since 1987 by Small Farmers Development Program (Messerschmidt, 1988). During FY 2021/22, only 179,646 AI policies were issued. Farmers out of 36 million households have at least some crop or livestock farming. The data show that farmers are not attracted to agriculture insurance despite subsidies on premiums, service is available in every village, and 20 companies sell the policies nationwide. National media, newspapers, and social media also cover the news and broadcast commercial advertisements regularly. A particular company has been assigned to the districts to promote the AI programs. The government has provided subsidies on premiums ranging from 50% to 80% since 2014. Experiences from different countries show that targeting the eligible beneficiaries is crucial to the success of a highly subsidized insurance program, especially in resource constraint developing countries (Reyes et al. 2017).

Considering the large number of populations engaged in agriculture, a study by GIZ (2014) was carried out to explore the demand for agriculture insurance. The study showed that most Nepalese farmers know about insurance but lack an understanding on agriculture insurance.

Agriculture insurance is an indemnity policy, but the indemnification mechanism for other properties and agriculture differs. Agriculture loss is compensated based on the cost of production, weather index and production yield. Nepal adopted the first two compensation modalities and hybrid models where loss is paid based on an average market price, farmer's price and price fixed by agriculture experts. Insurance premium has been set based on the sum assured, and it ranges from 5 to 8 percent for crops, fruits and vegetables; 1-2 percent for fish, 1.25 to 5 percent for birds; and 5 percent for cattle. Compensation against the loss is provided up to 90 percent to cattle in case of death and 50 percent in case of permanently disabled, up to 90 percent of the loss to cattle and fish, but it is 100 percent of actual loss for birds.

The paper aims to examine the level of awareness and perception of the farmers towards agriculture insurance as a risk management tool. The entire article is divided into five sections. The second section reviews the literature on the perception and awareness of agriculture insurance as a risk management tool, followed by the methodology part. The fourth section discusses the findings, and the fifth section concludes the paper.

II. Review of Literature

This study aims to measure the awareness of farmers on agricultural risk and their perception of agricultural insurance, which is regarded as one method of risk-minimizing or recovering—the former results from the farmer's reflective learning and exposure to information sources about it. The latter is formed from their experiences of access, availability, acceptance and adoption of the insurance policy. The paragraphs in separate sections discuss the concepts of awareness and perception and then measure and analyze them.

There is a Nepali proverb- *kathako khutto; sasako dhan* (as a wooden leg can be broken anytime; the cattle can die) so that Nepalese people think much while collecting property of living beings (cattle) than in non-living (land, bullion etc.).

Any insurance product, including agriculture insurance, is a complex financial instrument that is hard to understand. The insurance regulator has assigned each general insurance company to promote agriculture insurance through the different awareness programs in particular districts. Farmers become aware of the risk and its management from various sources, and co-farmers are one of the significant sources of information about risk and agriculture insurance. Similarly, they share their perceptions and discuss the pros and cons of buying insurance. Shared perceptions of the aims and requirements of innovation are essential aspects of the invention.

Farmers' awareness of agriculture insurance

Various studies concluded that Nepalese are not much more aware of agriculture insurance. The reasons for low awareness and low growth are a lack of understanding of agriculture insurance among the low-income segments, and lack of public confidence towards the agriculture insurance market, a lack of relevant human resources in rural areas, and insufficient adequate auxiliary services, such as agriculture technicians, weather stations, and others. Similarly, commercial insurers lack interest in agriculture products due to high administrative costs, geographical and infrastructural constraints and farmers' low and irregular income. Another reason for the low growth of the agriculture insurance market is a shortage of human resources to assess the risks of agriculture and calculate the input costs and losses related to crop production (MEFIN, 2014).

Some studies (Adebayo et al. 2012; Ajayi 2014) have assessed farmers' climate change awareness, perceptions and adaptation options, yet these studies have failed to determine the effects of awareness and perception on adaptation. Moreover, very little is said about the factors influencing farmers' awareness.

Insurance is a risk pooling and sharing mechanism where many farmers contribute to a small number of losses. A study by Ghimire, Timsina & Gauchan (2016) exposed that everyone wants a refund of their premium. This is against the law of insurance. If farmers think paying a premium is a waste of money in case of no loss, it is a poor level of understanding towards the insurance. Another reason for low knowledge about insurance is the lack of proper interaction at the local level and the lack of effective image-building and awareness of officers of implementing agencies (Sona et al., 2018). The farmer's awareness is raised by a group-based approach to claim settlement (Timsina et al., 2016).

A study by Kandel (2019) found that all insured farmers knew about livestock insurance, and most insured farmers knew about the government's premium subsidy scheme. Less than one-third of the uninsured farmers also know insurance.

Farmers' perception of agriculture insurance

Studies show that the adoption of risk management strategies is affected by farmers' age, education level, extension experience, monthly household income, farming areas, land ownership and risk aversion nature (Adnan et al., 2020) and farmers' risk perception of a flood, heavy rains and hailstorms, heavy winds, pest and diseases, fire in curing furnaces, drought and risk attitude affect the utilization of agricultural risk management tools (Lu et al., 2017). The traditional practices of risk management like crop diversification in a piece of land and risk sharing either among friends and family members through contributing in cash or other kinds are only suitable for idiosyncratic shocks, e.g. fire, livestock death, however, fail to work in the time of covariate shocks, e.g. drought or flood as it affects the entire community. Agriculture insurance is one of the best strategies to address farm risk and encourage farmers to embrace modern production practices with more significant potential for better and quality yield (Olubiyo et al., 2009).

The farmers can accept a crop insurance plan with a low premium and offer maximum compensation against losses (Ghazanfar et al., 2010). The study further examined that

education and landholdings were significant with the level of awareness, while age was not found to be substantial with awareness. Farmers' Income in the previous year positively impacted the adoption of insurance (Farzaneh, Allahyari, Damalas, Seidevi, 2017) and farmers with positive claim settlement experience demand more insurance (Sundar and Ramakrishnan, 2015).

Insurer farmers were adopting insurance as a major tool for risk minimization in bananas in Nepal. Besides insurance, the use of pesticides/insecticides and staking were the essential tools used for risk minimization for both types of farmers, insured and non-insured. More non-insurer farmers (66.6%) were adopting compost and chemical fertilizers as compared to insurer farmers (30%). More than 50% of farmers adopted variety change as an option for climatic risk minimization in the case of both insurers and non-insurer. It was found that farmers now replaced the green variety with *the Malbhog* variety (e.g. *Harisal*, *Jhapali*, *Hariyo* to William hybrid, G-9) because green varieties are more susceptible to breaking by the wind. Insurer farmers also used different techniques like planting the windbreaks (perennial trees) and adjusting planting time to escape from Falgun / Chaitra wind (Ghimire et. al, 2016).

The limited knowledge of agricultural insurance products constrains agricultural insurance access and acceptability. The study suggested that more insurance companies be incentivized to augment already existing efforts by Ghana Agricultural Insurance Pool (GAIP) to enrol more smallholder farmers. The government can consider bundling existing insurance products with credit or inputs under the Planting for Food and Jobs Programme (PFJ) to improve the uptake and accessibility of agricultural insurance (Ankrah, Kwapong, Eghan, Adarkwah, Gyambiby, 2021).

Mehrad and Prabhum (2021) study in Iran suggested that agriculture premium is high however, farmers are motivated to acquire insurance service as it provides adequate protection against risk. Due to the adverse weather incidences in Iran, weather-based crop insurance is expected to provide sufficient protection to the insured wheat cultivators in events of loss in crop yields.

Measuring Awareness and Perception

Awareness is a person's state of having information and understanding about something. As per Thorndike's (1918) famous *Credo*- "All that exists, exists in some amount and can be measured" (p. 16), a person possesses a certain amount of awareness; however, if a person possesses the amount less than the required amount of information and understanding about the something that needed to operationalize any activities related to it. Similarly, (being highly) aware means having sufficient knowledge and understanding. If measured by a valid scale, measurement theory accepts that such a psychological reality can be represented by data (Yusoff & Janor, 2014). However, this assumption raises a few genuine questions- 'can another person measure one person's level of awareness? 'Can a person communicate his/her level of awareness to the other person accurately? 'What is the tool for measuring it and communicating?

There are two ways of measuring one's level of awareness about something. In subjective measures, awareness is assessed based on the observers' self-reports of their conscious experiences, and persons' forced-choice decisions demanded by others by presenting different stimulus statements is called objective measure (Merikle, Smilek & Eastwood, 2001). The objective method is more preferred, favoured and practiced. Measuring or assessing one's awareness concerns how accurately and differently a person has understood particular subject matter, including its application. Since this amount and accuracy can be measured in three ways. The first is Yes/No question measured on a nominal scale. The second is providing the forced-choice questions (multiple choice), asking them to identify the correct responses. And the last is asking about their level of information and understanding in face-to-face but in qualitative interview form. The former two though prepared by the expert can be administered by well-trained enumerators but the latter needs informal talking that requires rapport, trust, and confidentiality.

Similar to awareness, perception is a psychological trait. Individuals make their perception toward something. Perception is formed due to his/her information understanding, experiences, feelings, etc. (Taylor, Peplau & Sears, 2003). Awareness is how correctly one has informed and understood something, and Perceptions are how one wants to apply this in doing something. It is called attitude if the perception thrives to actions or observable activities.

Nevertheless, perception results from how one feels, realizes, and believes something. The perceivers interact with the targets who possess either certain or uncertain self-conceptions about it, then realize compatibility or compatibility to the expectation, and thus form the ultimate opinion about the target (ibid, p. 95). Therefore, a perception study is a particular type of opinion survey where the idea is formed from the experiences of individuals. The formation of perception about any target is influenced by the person's motives, interests, expectations, interests, experiences, etc. These things are intangible and internal to a person (Heynicke, Rau, Leising, Wessels & Wiedenroth, 2022). Thus, a person perceives a target positively or negatively; such feelings are subjective. Therefore, the level or amount of positivity or negativity, or acceptance or unacceptance, is measured by self-reporting and rating.

A farmer gets information about risk in business, understand the way of risk management, and buys an insurance policy as a central measure. The level of awareness results in deciding to purchase policy and experiences with insurance from buying to loss-claim consequences to perception formation. Therefore, farmers' perception of agriculture policy can be measured by the bipolar scale of positive at one and negative at another end. But the amount can be further graded as very positive, positive, neutral, negative and very negative, called the Likert scale (Heynicke et al., 2022). The best way of measuring a person's perception is regarded the self-rating. Therefore, a scale was developed and asked the farmers to provide their self-rating in the statement provided by the expert researcher.

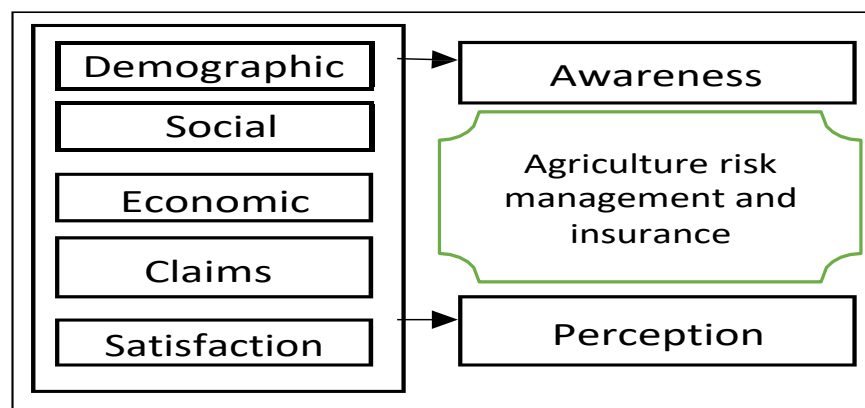
A study (Mustafa et al., 2018) highlighted that farmers' level of awareness is determined by the environmental communication network, such as socioeconomic, institutional, and

geographic factors, mainly education, experience, family size, landholding, farm cooperation, animal holding, Tube well ownership, Members of the organization., access to agricultural credit. Access to the marketing of produce, access to extension services.

The paper examines the relationship between the demographic, social, economic, claims and satisfaction-related variables with their awareness and perception towards agriculture, as shown by figure 1 (conceptual framework).

Figure 1

Conceptual Framework



III. Research Methods

Population, sampling techniques and sample size

The study population covered all farmers with agriculture insurance policies and received a claim against the loss on agriculture or a claim intimated but not settled. The size of the population is assumed to be infinity. Multiple sampling techniques viz. cluster (Metropolitan cities and Wad), purposive (information reach) and quota (coverage of at least ten wards of each district) have been applied to select the respondents from 10 out of 29 wads in Bharatpur and 14 out of 33 wards in Pokhara. Wads were chosen randomly, and respondents were randomly selected from the list of nonlife insurance companies.

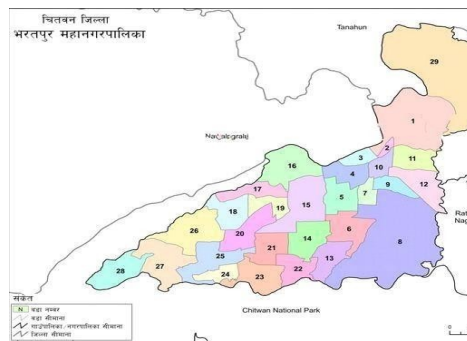
Sample size has been determined using the Cochran formula (Cochran, 1977) assuming an infinite population of two metropolitan cities considering a study unit ($n = Z^2 pq / e^2 = (1.96)^2 (0.5) (0.5) / (0.5)^2 = 385$). Two hundred respondents were selected from each city, and information from 400 samples was included in the study. The study was carried out from December 2021 to March 2022.

Study area

Out of four metropolitan cities in Nepal, two are outside the Kathmandu valley. Bharatpur Metropolitan city of Chitwan district (inner terai) and Pokhara Metropolitan city of Kaski district (mid hill) are selected for the study. Both districts have similar types of agriculture

risks. Kaski district suffers from multi perils like hailstorms, heavy rainfall, windstorm, droughts, floods, storms, high humidity, high temperatures and inundation, major threats to agriculture in Chitwan (Ghimire et al., 2016). Both districts have good commercial agriculture practices, easy access to the agriculture market and agriculture-related services. The majority of the residents have subsistence farming, and few of them are gradually shifted to commercial agriculture.

Bharatpur Metropolitan City, Chitwan



Pokhara Metropolitan City Kaski



Source: <https://www.nepalarchives.com/>

Variables of the study

The study has considered 13 independent variables, viz. demographic (6) and economic (3) characteristics of respondents and agriculture insurance claim-related variables (4) (Table 1). Similarly, awareness-related nine and perception-related five constructs were developed to measure the level of awareness and perception towards agriculture insurance and risk management practices (Table 2).

Data collection instruments and data analysis tools

The awareness and perception towards agriculture risk management practices have been summarized and measured under the nine and five constructs, respectively. A five-point Likert scale ranging from strongly disagree (denoted by 1) to strongly agree (indicated by 5) by constructing a structured questionnaire. Reliability was tested by piloting with 40 respondents. The face-to-face interview ensured the instrument's validity; the experts reviewed the questionnaire (Groves et al. 2009). The questionnaire was prepared in the Nepalese language, and the respondents constructed easily understood sentences (DeMaio and Landreth 2004; Groves et al. 2009).

Students of Masters level (MBA) and Bachelor's were trained and deputed to carry out the survey. Proper and sufficient guidance and support were made by researchers while collecting the data. Potential respondents (policyholders) were contacted by telephone and

requested to participate in the study with the help of concerned insurance companies. Every respondent was contacted for the face-to-face survey. The quantitative approach is used to analyze the data with the help of mean, standard deviation, percentage and chi-square test, t-test and F test (ANOVA) considering the interval data (Norman, 2010).

Table 1*Independent Variables*

Demographic Variables	Abbrev.
Sex	Sex
Age	Age
Family size	Fsize
Caste	Caste
Education	Edu
District of respondents	Dist.
Economic related variables	
The major source of Income	MSI
Food Sufficiency	Food
Economic Class	Eco.
Claims related variables	
Satisfaction on Sum Assured	SSA
Status of claim settlement	SCS
Satisfaction by claim received	SCR
Reasons of dissatisfaction	ROD

Table 2*Dependent Variables*

Constructs	Code	Measures
Livestock and crops are risky sectors	Risky Sector	Awareness
The risk of crops can be managed in a traditional way	Crop Tradition	
The risk of livestock can be managed in a traditional way	Livestock Tradition	
Insurance company helps me on managing risk	Risk Management	
Insurance discourages traditional techniques of risk management	Traditional Technique	
Proper use of medicine for livestock risk can be reduced	Medicine	
Loss increases after buying an insurance policy	Loss Increase	
Negligence should not be done even if we have purchased insurance	Negligence	
An increase in the market price of livestock has more possibility of a claim.	Market Price	
Insurance company plays an essential role in increasing knowledge about insurance.	Knowledge	Perception
Agriculture insurance is suitable for farmer	Good	
Insurance work on the law of large number	Large number	
Trust is required between the insurer and the insured for doing insurance	Trust	
Loss should be minimized, although the insurer provides a claim	Loss minimize	

IV. Result and Discussion

Respondents' general information

Demographic and socioeconomic information of respondents of Bharatpur (denoted as Chitwan district – C) and Pokhara cities (indicated as Kaski district – K) have been presented separately (Table 3). As per Table 3, the highest number of respondents (35%) falls under the age group between 41 to 50 years. Almost all (96%) believe in Hinduism, and 91% of respondents belong to Brahmin and Chhetri community. The highest number of respondents (40%) are only literate (below SEE level), and more than 70% of the respondents have a family of up to five members. Most respondents (53%) have land above 8 Ropanis. Almost one-third (32%) of respondents have sufficient agriculture production for annual consumption, and the majority (54%) are small-scale farmers. Most respondents (52%) have a yearly Income above Rs. 230,000.

The association has been found significant between the districts of respondents and religion ($p=0.011$), caste ($p=0.045$), education, size of family, size of farmers and categories of farmers ($p=0.001$). The study does not find a significant association between the respondent's sex, age group and area of the land held by respondents with residing districts, as suggested by the p-value of the chi-square test ($p > 5\%$).

The result is similar to Lu, Latif and Ullah (2017) study that age, education level, extension facility, monthly household income, farming land areas, land ownership, and risk aversion nature of farmers influence adoption decisions.

Table 3

Respondents' general information

Variables	Attributes	Kaski		Chitwan		Total		P-value
		N	%	N	%	N	%	
Sex	Female	48	24%	53	27%	101	25%	0.565
	Male	152	76%	147	74%	299	75%	
Age	Up to 30 years	25	13%	26	13%	51	13%	0.109
	Above 30 to 40 years	65	33%	44	22%	109	27%	
	Above 40 to 50 years	69	35%	72	36%	141	35%	
	above 50 to 60	29	15%	37	19%	66	17%	

Variables	Attributes	Kaski		Chitwan		Total		P-value
		N	%	N	%	N	%	
	above 60 years	12	6%	21	11%	33	8%	
Caste	Brahmin / Chhetri	181	91%	183	92%	364	91%	0.045
	Janajati	10	5%	16	8%	26	7%	
	Dalit	5	3%	1	1%	6	2%	
	Others	4	2%	0	0%	4	1%	
Education	Literate	96	48%	62	31%	158	40%	0.001
	Up to SEE	33	17%	78	39%	111	28%	
	Intermediate	63	32%	37	19%	100	25%	
	Bachelors	6	3%	9	5%	15	4%	
	Above bachelors	2	1%	14	7%	16	4%	
Size of family	Up to 5 members	150	75	132	75	282	71%	0.048
	Above five members	50	25	68	25	118	30%	
Categories of Farmers	Business farming	84	42	31	42	115	29%	0.001
	Sufficient production for yearly consumption	51	25.5	77	25.5	128	32%	
	Little excess for sale	31	15.5	51	15.5	82	21%	
	Insufficient production for	34	17	41	17	75	19%	

Variables	Attributes	Kaski		Chitwan		Total		P-value
		N	%	N	%	N	%	
	yearly consumption							
Size of Farmers	Large scale farmer	35	17.5	12	17.5	47	12%	0.001
	Medium type farmer	71	35.5	67	35.5	138	35%	
	Small type farmer	94	47	121	47	215	54%	
	Total	200	100%	200	100%	200	100%	

Source: Field Survey, 2021

Awareness of farmers towards agriculture risk management and insurance

The Likert scale is commonly used to measure attitudes, knowledge, perceptions, values, and behavioural changes (Vogt, 1999). Farmers' awareness towards agriculture risk management and insurance (ARMI) has been measured using the five-point Likert scale. As Likert scale data are considered interval scale, the mean score, Standard Error of Mean (SEM), and rank correlation (ρ) has been presented in Table 4.

Most farmers agree that agriculture is risky; negligence should not be done even if we purchase an insurance policy or medicine to protect livestock from death. The average of the mean value of nine statements reveals that awareness of both districts Kaski (K) and Chitwan (C) towards the ARMI is higher than average (3.0). It indicates that farmers of Chitwan are slightly more aware (mean = 3.51) than those of Kaski (mean=3.50). The standard error of the mean of both districts is less than 0.1 specifies that opinion of sample respondents is closely distributed around the population mean. Farmers' awareness level in both districts on different issues towards the ARMI was similar, as proved by Spearman's rank correlation value which is a strong positive association (0.90) (Dodge, 2010, p. 502).

The perception of the farmers of both districts towards the ARMI is above the average (K= 4.2 and C=4.5). It shows that farmers in Chitwan have slightly higher positive perceptions than Kaski. The standard error of mean value is minimum in both districts, indicating less deviation of opinion to the mean value. The awareness between the two districts is more similar ($\rho=0.90$) than perception ($\rho=0.60$) but has a positive and higher degree of association towards the different issues on ARMI.

Table 4*Descriptive statistics of respondents' opinion*

Statement	Mean				SEM	
	K	Rank	C	Rank	K	C
Risky Sector	4.85	1	4.52	2	0.04	0.07
Crop Tradition	1.20	9	2.33	8	0.05	0.1
Livestock Tradition	2.69	7	2.60	7	0.13	0.11
Risk Management	3.96	4	3.36	6	0.09	0.11
Traditional Technique	3.95	5	3.73	5	0.1	0.1
Medicine	4.25	3	4.47	3	0.08	0.07
Loss Increase	2.61	8	2.06	9	0.11	0.09
Negligence	4.61	2	4.70	1	0.07	0.06
Market Price	3.41	6	3.86	4	0.14	0.1
	3.50		3.51		0.09	0.09
Perception towards the ARMI						
Knowledge	3.830	4	3.66	5	0.09	0.1
Good Schemes	4.960	1	4.87	2	0.02	0.03
Large number	2.860	5	4.35	4	0.13	0.07
Trust	4.800	2	4.74	3	0.04	0.04
Loss Minimize	4.830	3	4.91	1	0.04	0.02
	4.26		4.51		0.06	0.05

Spearman's rank correlation (Rho) on awareness = 0.90, and on perception = 0.60

Awareness of respondents towards ARMI (t-test)

Most farmers agree that agriculture insurance is a good scheme for the farmers; trust between farmers and insurance companies is essential to make the insurance successful, and even if we get compensation, we have to minimize the loss minimization as far as possible. The p-value of the t-test and F-test (ANOVA) (at a 5% significance level) has been considered while analyzing the mean difference between groups of different constructs. The opinion of farmers in both districts is separately analyzed based on 12 predictors (Table 1). A five-point Likert scale measures 14 opinions (Table 2).

Based on the p-value of the independent t-test, the sex of respondents has no significant relationship with the opinion of the farmers towards ARMI in both districts. Age has also been considered an insignificant factor in opinion towards the ARMI in both districts. Two statements, "traditional technique of risk management is not in practiced due to the insurance" and "possibility of loss is increased due to the increase in the sum assured of the cattle and birds" ($p < 0.05$), have been found significant in Chitwan based on the age of the respondents. Family size is not a significant predictor towards the ARMI except for the statement "Insurance companies teach how to manage the risk" in the Chitwan district.

Educational level is found insignificant except for one issue "Crops risk can be managed by the traditional approach" in the Kaski district. Farmers' awareness of ARMI is different based on the amount of food they have (sufficient food for their family by their production or not) in the Kaski district regarding the statement "The traditional approach can manage livestock risk", but the rest of the statements have been found insignificant (Table 5).

The analysis concludes that out of nine issues on ARMI, four out of five predictors are significant among 45 relationships. It means sex is entirely insignificant, and age, family size, educational level and food sufficiency are also insignificant to two more extents towards the awareness on AMRI.

Table 5

Awareness of respondents (t-test)

Statement	P value of Independent t-test									
	Sex		Age		Fsize		Edu		Food	
	K	C	K	C	K	C	K	C	K	C
Risky Sector	.82	.77	.60	.58	.89	.43	.17	.34	.26	.03
Crop Tradition	.81	.40	.47	.84	.13	.96	.04	.49	.76	.29
Livestock Tradition	.72	.57	.45	.76	.20	.47	.14	.85	.01	.60
Risk Management	.67	.52	.33	.87	.79	.05	.44	.56	.33	.69
Traditional Technique	.14	.48	.66	.02	.60	.19	.46	.75	.41	.19
Medicine	.12	.70	.95	.20	.94	.27	.13	.86	.77	.30
Loss Increase	.43	.82	.53	.32	.63	.84	.80	.53	.66	.45
Negligence	.34	.98	.06	.45	.20	.44	.20	.73	.48	.21
Market Price	.10	.79	.57	.04	.83	.76	.96	.23	.76	.62

The same opinion again has been tested with the help of the p-value of F statistics to identify whether their opinion has a significant difference based on different predictors in Table 6. The table has 63 relationships (seven predictors and nine statements), out of which more than half (53%) relationships are significant ($p < 5\%$).

Caste and main source of Income (MSI) are found insignificant in Kaski and Chitwan (except in one case, "Negligence should not be done buying insurance"); the economic condition of the farmers (Eco.) is found significant in Kaski only on "Livestock risk can be managed traditional way", and in Chitwan "due to the insurance, the traditional technique of risk management gradually decrease". The variable satisfaction on the sum assured (SSA) is significant on five statements in the Kaski district and two in the Chitwan district. The satisfaction of claims settlement (SCS) variable has only one considerable statement in both districts. Satisfaction after the number of claims received (SCR) is significant in seven Kaski opinions and five Chitwan district statements. Similarly, the reason for dissatisfaction with the claim settlement (ROD) is substantial, with six views in Kaski and three statements in the Chitwan district.

The study shows that the satisfaction of claims amounts mainly influences the awareness of respondents towards ARMI received, followed by reasons of dissatisfaction (RoD) and satisfaction on the sum assured (SSA) and economic condition of farmers (Eco.). The least influencing factors are the level of satisfaction with claims settlement (SCS) and major sources of Income (MSI). The caste and significant sources of Income of the respondents are insignificant towards the ARMI views of the respondents. Analysis posits that economic factors play important roles in ARMI awareness, followed by the level of satisfaction Table 6.

Table 6

Awareness towards the agriculture risk management and insurance (F test)

Statement	P value of F statistics (ANOVA)														
	District	Caste		MSI		Eco.		SSA		SCS		SCR		ROD	
		K	C	K	C	K	C	K	C	K	C	K	C	K	C
Risky Sector	0.7	0.1	0.0	0.4	0.4	0.0	0.5	0.8	0.2	0.0	0.0	0.0	0.0	0.5	
	5	2	7	4	1	5	8	7	6	1	1	1	4	7	
Crop Tradition	0.4	0.2	0.8	0.3	0.7	0.6	0.0	0.1	0.6	0.4	0.0	0.0	0.0	0.0	
	9	4	8	4	3	7	5	2	9	7	1	4	7	2	
Livestock Tradition	0.1	0.5	0.1	0.7	0.0	0.7	0.0	0.4	0.8	0.6	0.0	0.3	0.0	0.0	
	1	4	5	8	1	8	1	1	9	3	1	8	1	1	
Risk Management	0.3	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.5	
	8	6	8	9	9	4	1	1	7	6	1	1	1	2	
Traditional Technique	0.6	0.6	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.4	
	7	1	4	7	1	2	1	1	1	4	1	2	1	3	
Medicine	0.5	0.4	0.7	0.0	0.0	0.1	0.4	0.2	0.2	0.3	0.5	0.0	0.5	0.8	
	6	4	4	8	6	6	7	7	5	0	9	5	0	0	
Loss Increase	0.2	0.9	0.2	0.0	0.7	0.5	0.0	0.1	0.4	0.2	0.0	0.5	0.0	0.2	
	4	2	0	9	0	7	3	0	2	0	1	1	1	3	
Negligence	0.6	0.0	0.9	0.0	0.9	0.1	0.1	0.0	0.3	0.7	0.5	0.1	0.5	0.0	
	2	1	1	5	8	8	1	8	9	5	5	9	5	1	
Market Price	0.3	0.6	0.2	0.4	0.1	0.0	0.0	0.2	0.7	0.5	0.0	0.1	0.0	0.9	
	3	9	6	1	4	1	8	2	4	5	1	1	2	1	

Perception towards the ARMI

Table 7 exhibits that respondents' sex and age are not significant predictors. Family size also has no significant difference except in the Kaski district, and the perception is different based on the family size on the issue "Insurance functions based on the law of large number". Education is a significant factor in both districts on statements "Insurance functions based on the law of large numbers", "Trust is essential between insured and insurer to make success the insurance business", and "It is better not to happen any loss even insurance provides the compensation against the loss" in Chitwan district". Sufficiency of food is a significant factor in both districts on the opinion "Insurance functions based on the law of large number" and significant in Kaski district opinion on "Trust is essential between insured and insurer to make success the insurance business", and "It is better not to happen any loss even insurance provides the compensation against the loss" in Chitwan district". Out of 25 relations, few (only six) have significant relations indicating that similar to

awareness, and the perception is also not influenced by sex, age, family size, education and food sufficiency. The study concludes that economic reasons (food sufficiency) are more influencing factors, followed by the education of the respondents (knowledge). At the same time, age and sex are insignificant variables towards the perception of AMRI.

Table 7

Perception towards the agriculture risk management and insurance (t-test)

Statement	P value of Independent T-test									
	<u>Sex</u>		<u>Age</u>		<u>F.size</u>		<u>Edu.</u>		<u>Food</u>	
	K	C	K	C	K	C	K	C	K	C
Knowledge	0.11	0.26	0.77	0.33	0.95	0.26	0.77	0.29	0.49	0.46
Good Schemes	0.18	0.07	0.96	0.73	0.72	0.70	0.58	0.12	0.47	0.09
Large number	0.20	0.79	0.71	0.98	0.05	0.29	0.27	0.03	0.01	0.03
Trust	0.68	0.33	0.31	0.51	0.58	0.13	0.77	0.01	0.01	0.71
No loss	0.68	0.40	0.15	0.70	0.47	0.70	0.94	0.85	0.01	0.87

F test

According to the p-value of the F test (ANOVA) in Table 8, it can be seen that caste is not significant in Kaski but significant in Chitwan to the statement "Insurance functions based on the law of large number". The major source of income is significant on two statements in Kaski but none of the statements in Chitwan. The economic status of the respondents has been found significant in three statements in Kaski but one in Chitwan. Satisfaction on the sum assured of the livestock is significant for one statement on Kaski but none in Chitwan. Satisfaction with claim settlement is found insignificant in both districts. Reasons for dissatisfaction is significant in three statements in Kaski but none of the statement in Chitwan. Farmers' opinion towards the perception of ARMI varies by ten statements in Kaski and four statements in Chitwan out of 35 pairs of relations.

The perception towards the AMRI is influenced by the economic status of the respondents, the status of receiving the claims, significant income sources and reasons for dissatisfaction with the claims. But, satisfaction from the sum assured, caste and satisfaction from the claims are not important variables. Based on the findings, it is evidenced that economic reasons and claims-related factors are more significant variables that influence the respondents' perception towards agriculture risk management and insurance.

Of 168 pairs of relations, 65 (39%) associations are significant. Among them, the Kaski district belongs to 60%, and the Chitwan district belongs to 40%. The awareness and perception of farmers of Kaski (Pokhara Metropolitan city) towards the AMRI were more significant due to different variables than in Chitwan. However, Chitwan's awareness and perception level is slightly higher than Kaski's and less influenced by respondents' demographic, socio, economic and claims-related factors (Table 8).

Table 8*Perception towards the agriculture risk management and insurance (F test)*

Statement	CASTE		MSI		ECO.		ANOVA		SCS		SCR		ROD	
	K	C	K	C	K	C	K	C	K	C	K	C	K	C
Knowledge	0.7	0.8	0.8	0.2	0.3	0.0	0.1	0.3	0.1	0.5	0.1	0.0	0.1	0.3
	0	8	0	8	3	1	3	2	0	9	2	1	0	9
Good	0.5	0.1	0.6	0.7	0.4	0.4	0.7	0.4	0.7	0.5	0.6	0.0	0.9	0.4
Schemes	1	3	3	6	2	2	8	1	1	3	8	2	9	3
Large	0.2	0.0	0.1	0.9	0.0	0.9	0.0	0.2	0.8	0.3	0.0	0.3	0.0	0.2
number	9	3	6	7	1	1	1	7	6	9	1	3	1	4
Trust	0.3	0.4	0.0	0.4	0.0	0.2	0.7	0.8	0.2	0.6	0.4	0.0	0.0	0.3
	1	6	1	9	2	6	4	1	0	2	0	6	1	4
Loss	0.0	0.1	0.0	0.3	0.0	0.6	0.7	0.1	0.1	0.4	0.6	0.9	0.0	0.2
Minimize	9	3	1	1	4	0	5	4	3	5	6	2	5	0

Discussion

The findings of our study is similar with some of the previous studies. It is similar with the findings of Subedi and Kattel (2021) as both agree on that financial factors such as risk coverage and income are important for joining agriculture insurance. In our study, the role of demographic variables have no significant influence towards the risk management and insurance awareness but study of Jha & Gupta (2021) shows the significant role of these variables. We find that awareness of farmers towards the agriculture insurance has been found positive and acceptable level which is contrast with the study of (Olubiyo et. al, 2009; Ghazanfar et al., 2010; Ghimire, Timsina & Gauchan, 2016; and Sona et al., 2018) but similar with study of Timsina et al. (2016) and Kandel (2019). Our finding of risk management awareness is similar to the study of (Ghimire et. al, 2016) and some variables have similar and some variables have contrast finding with the study of Mustafa et al. (2018)

Awareness towards the adoption of risk management strategies was affected by farmers' age, education level, extension experience, monthly household income, farming areas, land ownership and risk aversion nature (Senapati, 2020; Adnan et al., 2020) but in our study awareness and perception both are affected by financial matters similar with the study of Farzaneh, Allahyari, Damalas, Seidevi, (2017), claim settlement study similar with Sundar and Ramakrishnan (2015) to larger extent and education of the respondents to some extent. whereas our study partially akin with the study of Noor Khan, Hasan, (2022) that explains both demographic and financial factors impact the adoption of agriculture insurance.

V. Conclusions

Agriculture insurance is comparatively a new phenomenon in the Nepalese context, so its market and growth trend is not impressive for twelve years. The study aims to identify the level of awareness and perception of farmers residing in the Kaski and Chitwan districts

towards agriculture risk management and insurance. The study concluded that most farmers agree that agriculture is risky, negligence should not be done even if we purchase an insurance policy, and medicine protects livestock from death. Most of the farmers agree that agriculture insurance is an excellent scheme for the farmers, trust between farmers and insurance companies is essential to make the insurance successful, and even if we get compensation, we have to minimize the loss minimization as far as possible.

The study has drawn several conclusions based on descriptive and inferential analysis. Farmers' awareness and perception of the AMRI are reported above the average. Economic and claims-related factors are more influential than family size and education, whereas the sex and age of respondents are found to be insignificant factors. The rank correlation depicts that awareness and perception between both districts is a high and positive association.

Farmers of Kaski are more influenced than Chitwan in terms of their awareness and perception towards the AMRI opinion based on location, which is more influential than the size of the agriculture production. The study implies that insured and claim-recipient farmers are reasonably aware of agriculture insurance but lack traditional risk management techniques. Based on the findings and conclusions, we offer some policy implication to concerned authorities. Farmers are interested to know about the fundamentals principles and norms and values of the insurance which seems to be lack from the side of the insurer to provide the required information prior to sell the policy.

There is the lack among the farmers regarding the risk management techniques which is essential in insurance industry. Prior to sell the insurance policy, farmers should possess risk management methods to reduce the potential losses. The awareness and perception largely influenced by the claim settlement experiences so proper attention should be paid to settle the claims on time with proper amount. Similarly, while determining the sum assured, there should be justice to the farmers as it is also a major factor that influence the perception towards the ARMI.

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