

Farmer Behaviour Towards Crop Insurance in Haryana: A TPB Approach

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Abstract

Crop insurance products are a medium to mitigate and minimise risk arising out of natural and other calamities eventually leading to losses to farmers. In the Indian context, farming is not a lucrative profession and farmers suffer huge losses historically. These dynamics of the Indian agricultural sector make the crop insurance products an important product for the farmers. Here we examined the factors affecting farmers' behavioural intention towards buying crop insurance products in Haryana. Haryana was specifically chosen for the conduct of this study because of its rich agricultural background. The Theory of Planned Behaviour (TPB) has been used as a theoretical framework to create and test a model for explaining farmer behaviour in relation to crop insurance purchases. Data collected from 300 farmers in Haryana was analysed using PLS-SEM. This study's findings have influential practical implications for both policymakers and practitioners. Moreover, we contribute to a deeper understanding of farmers' crop insurance buying processes by advancing a model that can be used by future researchers.

Keywords: Farmers, Attitude, Subjective Norms, Crop Insurance, Purchase Intention

Introduction

Crop insurance is a yield-based insurance scheme that proves to be helpful for compensating a farmer's farm for the loss due to production problems (Gulati et al., 2018). Thus, it is beneficial for pre-sowing losses and post-harvest losses, including damage due to heavy rains and precipitation (Shahi Kiran & Umesh, 2012; Shirsath et al., 2019). In India, many private insurance companies offer

crop insurance, but the Pradhan Mantri Fasal Bima Yojna dominates in this regard (Tiwari et al., 2020). As the agriculture sector makes up more than half of the national population, crop insurance is crucial for this country. This is because the Indian agricultural landscape is one of the areas where farmers must face most provocations, such as uncertain weather conditions, market instability and many more (Panda et al., 2013). The data shows large losses due to floods and rains for 33.9M hectares drought for 35M hectares that occurred during 2015-2021. By the end of 2024, the unseasonal rains are supposed to cost a loss of about 13,000 million. Despite this, in the year 2014, only 6.7% of farmers have signed up for crop insurance, which implies the necessity of enhancing their awareness and participation (Ceballos et al., 2022; Nirmal & Babu, 2021). Crop insurance in India also plays a leading role. The government has understood the importance of crop insurance and has been taking steps to implement crop insurance across the country's agriculture (Mahul et al., 2012).

Given the significance of crop insurance, low diffusion and promising prospects for farmer welfare (Peleckis et al., 2015), the present study was inspired by the context of farmer behaviour. Farmers' decisional parameters on buying a crop insurance policy may depend on several factors (Ginder et al., 2009). Therefore, knowledge and scientific understanding of their behaviour are mandatory to develop impactful information that spreads the diffusion of crop insurance among Indian farmers and ensures sustainable agriculture (Aditya et al., 2018).

Further in this direction, the extant literature revealed a large number of studies on the influencing factors in various kinds of insurances, from life ones to health. Although, for the kinds of insurances specialised on the

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needs of the industry, there isn't any study that covers the behaviour of the participants. Owing to this research gap and the importance of crop insurance in India, we decided to undertake the current study.

The study is based in Haryana, an agriculturally rich Indian state that holds prime importance in the agricultural economy (Duhan & Singh, 2017). It seeks to delve into the nuances of farmer decision-making and shed light on the motivations shaping their behaviour towards crop insurance adoption. The objectives of this research are twofold. Firstly, to understand and explain the factors influencing farmers' behavioural intentions towards crop insurance. By examining farmer perceptions, we uncover the underlying determinants of crop insurance adoption. Secondly, the study intends to elucidate the impact of attitude, subjective norms and perceived behavioural control on farmers' behavioural intentions. We ultimately develop a holistic framework that explains the farmer behaviour in the context of purchasing crop insurance.

This paper is organised using a structured approach. The subsequent section will present a comprehensive review of the literature, and following the literature review, the research methodology employed in this study will be detailed. Subsequently, the results and findings will be presented and then the discussion section will explore the study's practical implications and theoretical contributions. Finally, we offer insights into subsequent research recommendations.

Theoretical Framework and Hypothesis Development

Before developing the research model to be used for the study, it is important to synthesise the existing research in the field of factors that determine farmers' behavioural intentions towards the purchase of crop insurance. We developed the theoretical model for our study based on an extensive literature review of extant studies within this framework. We chose the Theory of Planned Behaviour as our theoretical framework because it is one of the most comprehensive and widely used theories to predict human behaviour in various settings (Ajzen, 1991).

- *Attitude* is characterised by an individual's overall apprehension of a particular behaviour (Ajzen et al., 2018). It can be positive or negative, and it

constitutes the nuance by which human conduct can be portrayed and projected (Ajzen, 2005). Thus, in the context of the preceding behaviour, that is, buying crop insurance, we can seek to determine the attitude of the farmer. Positive attitudes towards the adoption of insurance lead to greater purchase intentions (Raza et al., 2020). Attitude is subjective and context-dependent and therefore it is important to study it as a factor affecting behaviour. In India, it is seen that in most of the cases farming communities are resistant to change (Botero & Salinas, 2013). Previous research highlights the need to understand the factors that shape attitude (Zeweld et al., 2017). Numerous studies have explored the determinants of attitudes towards insurance in general, but it is hard to find many studies in the context of crop insurance purchases in India (Nordmeyer & Mußhoff, 2023; Tam et al., 2021). The study also states that performance expectancy, government support, perceived credibility and interactivity with farmers also have a positive impact on the attitude and purchase behaviour of farmers (Handa & Kaur, 2024). One study also focused on rainfall index-based insurance that indicates new ways of crop insurance that protects agriculture in India due to rainfall (Dilip et al., 2021). On the basis of the above discussion, it is hypothesised that:

H₁: *Farmers' attitude towards buying crop insurance influences their behavioural intentions towards buying crop insurance.*

- *Subjective norms* are all about the perceived social pressure to perform or refrain from performing a specific behaviour (Bhatti & Akram, 2020). This concept is explained as "social influence" in the marketing literature (Ajzen & Fishbein, 1977). It can be understood best as something called "peer pressure". If people one considers important approve of a particular behaviour, there is a high likelihood of performing that behaviour or at least having intentions to perform that behaviour. Whereas in the case of disapproval, the behavioural intentions are low. The second key factor of the TPB is subjective norms (Cialdini & Goldstein, 2004). In the current study's setting, subjective norms reflect the impact of the current farmers, peers and neighbours on the farmers' purchasing

of crop insurance (Chummun & Mathithibane, 2021). Socially, by standard or critical attitudes towards insurance are likely to have significant and legitimate effects on a person's expectation to act, and the individual is likely to condemn or reject insurance to the extent that he or she believes it is socially acceptable or required (Ibrahim et al., 2020). Literature on insurance adoption has focused in on the social network's role in influencing the farmer's point of view. For instance, a study by Isaac et al. (2023) found that farmers who receive information about insurance from fellow farmers, are more likely to perceive insurance adoption as socially acceptable and beneficial. On the basis of the above discussion, it is hypothesised that:

H₂: Subjective norms towards buying crop insurance influences their behavioural intentions towards buying crop insurance.

- *Perceived behavioural control* is about the perception of the ease or difficulty of performing the behaviour (Zolait, 2014). Farmers who perceive

greater control over insurance approval are more likely to express intentions to purchase insurance (Duhan, 2017). Several studies have examined the factors influencing perceived behavioural control towards insurance adoption (Isaac et al., 2023). (Prakash & Gupta, 2014) describe the role of crop insurance in India. The purchase of crop insurance can also relate to investment behaviour because investment also affected multiple factors (Gaud, 2022). Based on the above discussion, it is hypothesised that:

H₃: Perceived behavioural control towards buying crop insurance influences their behavioural intentions towards buying crop insurance.

Fig. 1 depicts the research model of the current study and it is drawn from the theory of planned behaviour. As per the study objectives of the current work and the hypotheses framed for the study, the model proposed below is suitable and relevant. It explains the rudiments of farmer behaviour in relation to their buying behaviour for crop insurance products.

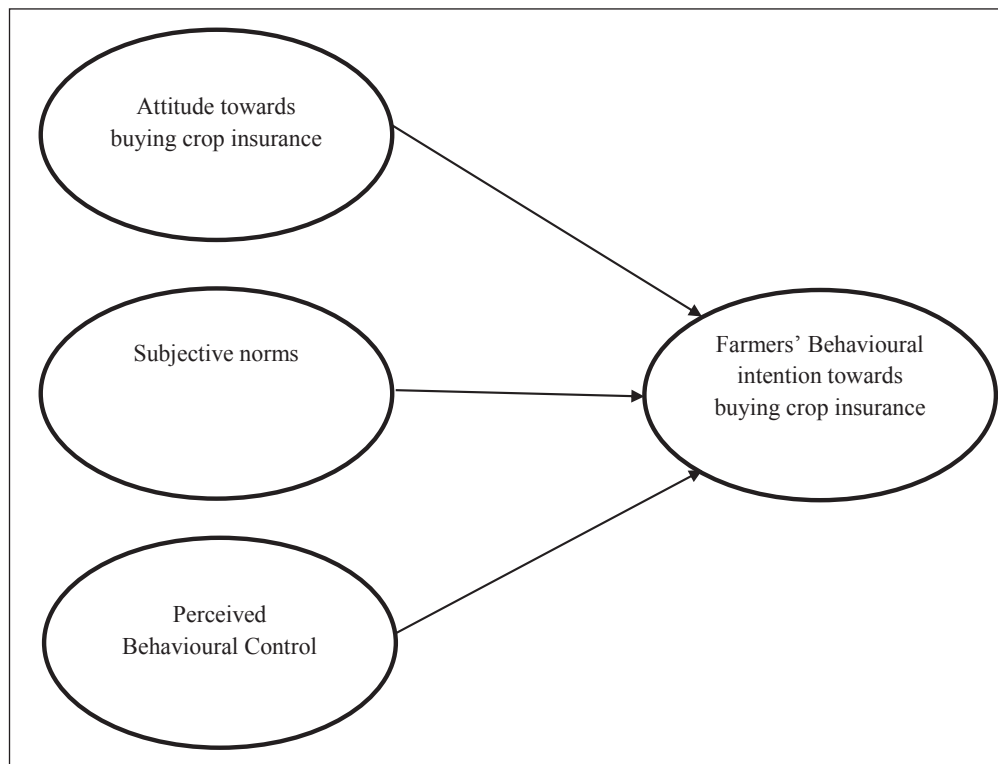


Fig. 1: Research Model

Research Methodology

Measurement Scale of the Study

The research methodology outlines the research design adopted to investigate the factors influencing farmers' behavioural intentions towards crop insurance in Haryana. First of all, the process of instrument design has been reported. The survey instrument was meticulously designed to capture relevant variables identified in the theoretical framework, including attitudes, subjective norms, perceived behavioural control and demographic information. The measurement instrument is comprised of two parts. Part A collected the demographic and farming-related data of the farmers. Part B included statements to measure the study variables which were derived from previous studies conducted in similar contexts. For measuring the attitude, 3 items were adapted from Huang et al. (2004) and 1 item was self-developed. For measuring subjective norms, all 4 items were taken from Bearden et al. (1989). For measuring perceived behavioural control, 1 item was adapted from Ajzen and Madden (1986) and 4 items from Chang (1998). For measuring behavioural intentions, all statements were adapted from Wang et al. (2005) and modified to the present context.

Sampling and Data Collection

The sample was drawn from Haryana and the survey was conducted in person with one of the authors acting as an enumerator in the process. For determining an adequate sample size, it is generally recommended that the absolute number of cases in factor analysis should be between 100 and 1000 (MacCallum et al., 1999; Mundfrom et al., 2005). Another often used rule of thumb is ten examples per indicator variable (Nunnally and Bernstein, 1994). As far as the sampling method is concerned, convenience sampling was used. Moreover, to ensure heterogeneity among respondents, snowball sampling techniques were also used. This mixed approach facilitated the inclusion of farmers with varied characteristics. This study's data was acquired from 300 respondents, and there was no need for data cleaning as the data were collected via a scheduled method. The data collection was done by taking 50 responses from each administrative division of

the state. It ensured adequate and effective representation of the whole state.

Data Analysis

After the data collection, the next important step is to make a decision about the data analysis and we chose PLS-SEM for the data analysis. It was considered an appropriate method of data analysis as per the guidelines of Hair et al. (2019) and the research objective laid down for the current study. Coming down to the specific method followed in the data analysis; first of all, the measurement model was examined to assess the reliability and validity of the measurement scales used in the study. Once the measurement model was validated, a structural model was estimated to examine the hypothesised relationships between the constructs. The outcomes of the data analysis are reported in the following section. These were interpreted in light of the research objectives and the previous literature to conclude.

Results

Characteristics of Sample Farmers

Table I provides information on demographics, education, farming experience and farm size as per the sample drawn for the study. According to the age distribution of the respondents, most of the cases fall into the 30-40 category, 38.7% of the sample; next is the 20-30 group with 27.6%. Persons aged 40-50 years accounted for 24% of the sample, while those aged 50 years and above accounted for 9.7%.

Table 1: Sample Profile

<i>Demographics</i>	<i>Category</i>	<i>Frequency</i>	<i>%</i>
Age	20-30	83	27.6
	30-40	116	38.7
	40-50	72	24
	50 and Above	29	9.7
Education	No Formal Education	56	18.6
	Schooling	167	55.7
	Graduation and Above	61	25.7

Demographics	Category	Frequency	%
Farming Experience (in years)	Up To 10	58	19.3
	10-20	95	31.6
	20-30	99	33
	More Than 30	48	16.1
Farm Size (in acres)	Upto 5	179	59.6
	5-10	65	21.7
	Above 10	56	18.7

Source: Survey data.

Regarding educational attainment, 55.7% of respondents had the highest number of schoolings, followed by 25.7% with a bachelor's degree or higher education and 18.6% reported no formal education afterwards. (33%), followed by 10-20 years (31.6%), up to 10 years (19.3%) and more than 30 years (16.1%). In terms of farm size, most of the respondents have farms up to 5 acres (59.6%), followed by farms of 5-10 acres (21.7%) and farms above 10 acres (18.7%). This extensive demographic information provides insight into the behaviour of the sample population.

Measurement Model

The assessment of the measurement model and structural model has been evaluated after the data screening process (Hair et al., 2019). The measurement model is evaluated based on reliability and validity (Table 2). The reliability of the model is assessed in Fig. 2, which depicts the assessment model. The measurement and structural models have been tested following a data analysis process as prescribed by Hair et al. (2019). We have used partial least structural equation modelling (PLS-SEM) for the assessment of the measurement model (outer model) and structural model (inner model). The measurement model evaluates the indicator reliability followed by checking internal consistency via composite reliability (CR) and Henseler's rhoA for all latent constructs within the suggested threshold level of 0.70 (Hair et al., 2019; Hair & Alamer, 2022). The average variance extracted (AVE) was examined to establish the convergent validity of constructs that were above the prescribed value of 0.50 (Hair & Alamer, 2022).

Table 2: Construct's Reliability and Validity

Constructs	Indicators	Loadings	Cronbach's Alpha	rho_A	Composite Reliability	AVE
Attitude			0.890	0.897	0.865	0.598
	Att1	0.775				
	Att2	0.712				
	Att3	0.892				
	Att4	0.711				
	Att5	0.760				
Subjective Norm			0.827	0.845	0.882	0.670
	SN1	0.755				
	SN2	0.763				
	SN3	0.796				
	SN4	0.754				
Perceived Behavioural Control			0.852	0.909	0.873	0.628
	PBC1	0.785				
	PBC2	0.905				
	PBC3	0.818				
	PBC4	0.854				
	PBC5	0.848				
Behavioural Intentions			0.876	0.898	0.917	0.761
	BI1	0.851				
	BI2	0.748				
	BI3	0.775				

Source: Author's analysis.

Assessment of Structural Model

The results of the structural model assessment are reported in Table 3. It is a general rule that collinearity should be tested before estimating any structural model (Hair & Alamer, 2022). Variance inflation factor (VIF) values were analysed and the highest tested VIF value was 1.117, indicating that all indicator values were below the threshold limit given by Hair et al. (2019). We

applied the bootstrapping method at 10,000 subsamples to examine the significance of path coefficients (Hair & Alamer, 2022). Attitude positively influences farmers' behavioural intention to purchase crop insurance ($\beta=0.68$, $p < 0.00$), thus supporting H1. Subjective norms also positively influence farmers' behavioural intentions towards purchasing crop insurance products ($\beta= 0.256$, $p < 0.000$), thus supporting H2.

Table 3: Results of Structural Model

Relationships	Std. Beta	P-Value	T-Value	BC 95% CI	Significance	F-Square	VIF
Attitude -> BI	0.268	0.000	3.541	[0.101 ; 0.359]	Yes	0.063	1.117
SN -> BI	0.256	0.000	3.811	[0.121 ; 0.384]	Yes	0.076	1.114
PBC -> BI	0.172	0.001	3.231	[0.054 ; 0.263]	Yes	0.035	1.073

Note(s): SN= Subjective Norms; PBC= Perceived Behavioural Control; BI= Behavioural Intentions

Source: Author's own.

In addition to this, H3 is supported whereby perceived behavioural control positively influences farmers' behavioural intention to buy crop insurance products. The results showed that perceived behavioural control ($\beta= 0.172$, $p < 0.01$) has a significant positive effect on farmers' behavioural intentions.

Discussion

The discussion is an attempt to interpret and contextualise the results presented in the previous section to provide insight into their practical and theoretical contribution implications. The findings of this study highlight factors influencing farmers' behavioural attitudes towards crop insurance in India and have important implications for policymakers, agricultural practitioners and researchers.

Practical Implications

The results of this study have several practical implications for those involved in agricultural risk management and insurance provision. First, the demographics of the sample farmers reveal valuable insights into the nature of potential insurance consumers in Haryana. Understanding the age distribution, education level, agricultural experience and farming background can help insurance providers tailor their products and services to meet the needs of the target population and their wishes

effectively. Second, an assessment of the decline in convenience, individual treatments and practices used to develop insurance products and marketing campaigns to promote the trade. Maprati atts, significant relationships between subjective beliefs, perceived attitude control and behavioural intentions have been demonstrated. The positive effects of attitudes, subjective beliefs and perceived behavioural control on behavioural intentions emphasise the importance of these factors that need to be addressed to promote the use of insurance among farmers. Insurers and insurers can use these findings to design interventions and incentives that promote positive attitudes towards insurance, for social norms that support insurance acceptance have increased, improving farmers' perceived control over insurance decisions. Increasing farmers' perceived empowerment by streamlining the insurance process, providing timely and accurate information and providing support services can help remove barriers so insurance cannot be taken away and encourage active risk management among farmers. In addition, identifying demographic factors that affect insured characteristics, such as age, education and field, can inform targeted communication and education programmes. Tailoring communication strategies and educational materials to specific demographic groups may improve awareness, understanding and acceptance of insurance products and ultimately lead to increased acceptance rates offered.

Theoretical Contributions

The present study provides a theoretical contribution to advancing our understanding of the factors affecting farmers' behavioural attitudes towards crop insurance in the context of Haryana, India. By applying the framework of the Theory of Planned Behaviour (TPB) and including additional perceived cost variables, this study extends existing theoretical models and provides empirical evidence supporting the utility of these factors in shaping insured behaviour among farmers. Findings highlight the utility of the TPB in conceptualising farmers' behaviours towards crop insurance, highlighting the importance of attitudes, subjective beliefs and perceived control behaviours' emphasis on insurance coverage. Furthermore, the inclusion of perceived cost as a determinant of insurance uptake behaviour enhances our understanding of the complex interplay of economic theory and behavioural concepts in agricultural risk management value, which is greater. The measurement model analysis confirms the reliability and validity of the parameters used to develop the TPB project and also confirms the robustness of this parameter model in the context of agricultural insurance. The findings contribute to the level of knowledge some provide on behavioural theory and provide empirical support for the role of TPB in rational insurance adoption behaviour among farmers in developing countries. Overall, the theoretical and practical insights gained in this study contribute to the on-going discourse on agricultural risk management and insurance provision and provide valuable guidance for policy makers, insurers and researchers seeking to promote sustainable and resilient agricultural practices in Haryana and beyond.

Limitations and Future Research Recommendations

Although this study offers valuable insights into farmers' behavioural attitudes towards crop insurance in Haryana, India, several limitations need to be acknowledged. First, reliance on self-reported information may introduce informational and social desirability biases. Future research could use other data collection methods to validate the findings. Furthermore, the cross-sectional design limits causal inference between variables.

Longitudinal studies could provide more robust evidence of the responsiveness of insurance to proactive behaviours and the effectiveness of interventions over time. The focus of the study in Haryana, India, may have limited generalisability. Simulations under agricultural conditions can elucidate contextual issues affecting insurance acceptance. Furthermore, the study did not examine cultural and organisational determinants of attitudes towards insurance. Future research could examine these sociocultural dynamics more closely to identify culturally relevant interventions. For future research, it is important to examine the effectiveness of policy interventions, financial incentives and risk communication strategies to promote insurance uptake. Additionally, the role of emerging technologies in improving access to insurance for smallholder farmers requires attention. Furthermore, longitudinal studies of the impact of insurance acceptance on agricultural productivity and household well-being can provide insights into long-term benefits. Addressing these limitations and exploring these future research directions could promote agricultural risk management and policy design tailored to the needs of smallholder farmers.

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