

RESEARCH PAPER

Economic analysis of farmer's awareness and perception about weather based crop insurance as tool of mitigation against climate variability in north Karnataka

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ABSTRACT

Protecting farming community against risks and uncertainty in agriculture, Government has launched several schemes like National Agricultural Insurance Scheme (NAIS) presently replaced by Pradhan Mantri Fasal Bima Yojana (PMFBY) during 2016 and weather index based crop insurance schemes (WBCIS). The present paper has reported the results of survey of 240 insured and non-insured sample farmers from Vijayapura and Bagalkot districts of North Karnataka which was conducted to assess the farmer's awareness and perception towards weather based crop insurance scheme. Descriptive statistical tools were employed to find out the results. Probit Model has been employed to ascertain the factors influencing on farmers awareness. From study it was clear that about 75 % of farmers are aware about scheme and large holding farmers are much more aware as compare to small holding farmers in study area. Results of Probit model revealed that social participation and education level are found significant with level of awareness. The study further revealed that more than half of the insured farmers (57%) opined that mandatory made by bank is the main reason for going insurance scheme. More than (70%) of non-insured farmers perceived that insurance is only for large and well-off farmers. Interviewed farmers (20%) opined that risk in agriculture could be reduced through insurance but, (30%) of farmers perceived that government needs to provide relief funds during disaster time to safeguard the farmers from crop losses.

KEY WORDS : Risk and uncertainty, Weather based crop insurance scheme (WBCIS), Descriptive statistics, Probit model, Awareness, Perception

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India is an agrarian country where half of the country's population is engaged in agriculture and allied activities, for their livelihood, contributing nearly about 13.9 per cent to the country's GDP. Agriculture production and farm incomes in India are frequently affected by natural calamities such as droughts, floods, cyclones, storms, landslides and earthquakes. In the face of uncertainty and risk in agriculture, various schemes

have been evolved over time in different countries to protect farmers; these include guaranteed prices, subsidized credit, and crop insurance, which are of immediate concern in the short-run (Suresh Kumar *et al.*, 2011).

As agriculture is highly dependent on weather, even small deviation at critical stages could affect crop growth significantly affecting the livelihood of the rural masses. In this context, weather based crop insurance is useful products for the farming community and one of the critical enablers to protect the farmers from recurrence of economic distress caused by repeated floods and droughts. Weather-Index Insurance (WII) is an innovative form of index insurance that covers farmers against weather related extreme events. The technology uses a proxy (or index) – such as the amount of rainfall, or temperature, or wind speed - to trigger indemnity payouts to farmers. This index helps to determine whether farmers have suffered losses from the insured peril and hence need to be compensated (World Bank, 2011 and Tadesse *et al.*, 2015). Realizing the importance of weather based crop insurance as a tool for minimizing the risk associated with climate variability and uncertainties arising in agriculture. Thus, keeping in view the present study attempts to investigate the farmers' awareness about weather based crop insurance as a tool to averse the risk in agriculture with following objectives.

- To study the farmer's awareness about weather based crop insurance scheme among insured and non-insured farmers of north Karnataka

- To study the farmer's perceptions about weather based crop insurance scheme.

METHODOLOGY

The study is conducted in North Karnataka by interviewing over 240 insured and non-insured sample farmers. The data required for study from the respondents were gathered through multi stage random sampling technique. In the first stage, two districts namely Vijayapura and Bagalkot were selected purposively. In the second stage, two taluks from each district were selected for collection of primary data. In the third stage, two villages from each taluks were selected based on extent of coverage and non-coverage of insurance scheme in study area. At the final stage, 20 insured and 10 non -insured farmers from each village were selected making the total sample size of 240 farmers. The primary

data were collected during 2016-17 using pre-tested and well structured interview schedule. The data were then scored, tabulated and analyzed using various suitable statistical tools.

Descriptive statistics :

Most of the results of the study are presented in tabular and descriptive forms. Descriptive statistical tools such as frequency distribution, percentages and averages were employed to analyze the awareness and perception of sample respondent about weather based crop insurance scheme in northern part of Karnataka.

Probit regression model :

The Probit Regression Model was employed to study factors influencing awareness about weather based crop insurance scheme. The dependent variable was the awareness level being the major tool of risk minimization, which was defined as $Y=1$ if farmers were aware about crop insurance, and 0, otherwise. The Probit model was specified as per Eq. (1):

$$Y = \alpha + \beta_1 \text{EDN} + \beta_2 \text{EXP} + \beta_3 \text{SOCIAL} + \beta_4 \text{EXTN} + \beta_5 \text{NEWS} + U_i$$

where,

Y = Awareness about crop insurance (1 for aware, 0 otherwise)

EDN = Education level of farmer

EXP = Farming experience of farmers (years)

SOCIAL = Social participation of farmer (1 for participation in social organization, 0 otherwise)

EXTN = Extension agency contact of farmer (1 for yes, 0 otherwise)

NEWS = Newspaper reading habit of farmer (1 for yes, 0 otherwise) U_i = Error-term

ANALYSIS AND DISCUSSION

The findings of the present study as well as relevant discussion have been summarized under the following heads :

Farmer's awareness about weather based crop insurance scheme (WBCIS) :

The farmer's awareness towards weather based crop insurance is more in the study area (Table 1). Awareness was more among large holding farmers (about 89.50 %) followed by medium holding farmers (about 86%). Among the total sample farmers nearly (about

76%) are aware about the scheme. It was also observed that nearly (about 24%) of sample farmers are less/unaware about the scheme in the study area.

Credit flow among sample respondents :

In Karnataka, a large number of Primary Agricultural Co-operative Banks (PACBs) apart from large number of commercial banks and Regional Rural Banks are working for financial inclusion in the state. The credit facilities utilized by the sample respondents have been presented (Table 2). It was observed that most of the short-term credits were disbursed by the PACBs, especially to small and marginal farmers, while long term loans were obtained through commercial banks. This clearly reveals that co-operative societies play very important role in disbursing crop loans to farmers in the study area.

Factors that influence farmer’s awareness about weather based crop insurance scheme :

The Probit Model was carried out to identify the factors that influenced the farmer’s awareness about the scheme. The estimates of the probit regression model have been presented (Table 3). The education level and social participation of the farmers were found significant influencing the farmers’ awareness about the scheme. Participation in social and community-based organizations like farmers association, self-help groups and co-operative credit societies, increased the probability of being aware. Thus, for encouraging participation of farmers in social activities and promoting education has been found as an important tool to improve the level of awareness about insurance schemes. These results were in line with results obtained by Suresh Kumar *et al.* (2011).

Table 1 : Farmers awareness about weather based crop insurance scheme (WBCIS)

Sr. No.	Farm-category (ha)	Number of farmers	Awareness		Insurance	
			Aware	Not aware	Insured	Non insured
1.	Marginal (Upto 1.0)	39 (16.25)	22 (56.40)	17 (43.6)	26 (66.66)	13 (33.34)
2.	Small (1.01-2)	81 (33.75)	55 (67.90)	26 (32.10)	52 (64.19)	29 (35.81)
3.	Medium (2.01-4)	72 (72.00)	62 (86.11)	10 (13.89)	47 (65.27)	25 (34.73)
4.	Large (>4)	48 (20.00)	43 (89.50)	5 (10.50)	35 (72.90)	13 (27.10)
5.	Total	240 (100.00)	182 (75.80)	58 (24.20)	160 (66.66)	80 (33.34)

Note: The figures within the parentheses indicate percentage under a category
Source: Field survey data, 2016

Table 2 : Details of credits availed and repayment among sample farmers

Source of credit	Credit availed		Repayment	
	No. of farmers	Amount (in lakh.)	No. of farmers	Outstanding amount (in lakh.)
Short-term credit				
Commercial banks	34	35.40	25	28.50
Cooperatives society	79	32.00	51	23.06
LDBs	07	0.36	06	0.29
Friends and relatives	15	3.50	04	1.50
Moneylenders	20	8.80	09	3.25
Total	155	80.06	95	56.60
Medium-term credit				
Commercial banks	21	30.35	15	25.50
Cooperatives society	13	21.50	08	20.00
Money lenders	05	2.97	02	2.97
Total	39	54.82	25	48.47
Long-term credit				
Commercial banks	11	25.30	08	18.65
Money lenders	04	4.20	02	2.50
Total	15	29.50	10	20.65

Source: Field survey data, 2016

Perception towards weather based crop insurance in study area :

Table 4 and 5 revealed that insured and non-insured farmer's perception about the scheme. The respondents were asked to describe their perception about the scheme. More than half of the insured farmers (57%) considered bank compulsion was the main reason for joining insurance. Large number of farmers (77.08%) perceived that insurance scheme was good measure against risk and uncertainty and nearly (67%) of farmers perceived that premium was high under scheme.

Similarly, large number of farmers (66.25%) opined that they are getting compensation in time. Most of the respondents (50 %) expressed dissatisfaction while about (41 %) expressed satisfaction over the prevailing insurance schemes implemented by the public sector and the private insurance companies. Similar findings were reported by Jayathilaka and Abeynayake (2013). While, about (71.25%) of non-insured farmers perceived that insurance scheme is only for large farmers. The study further revealed that, inadequate publicity about scheme (65%) is the main reason for not availing the scheme.

Dependent variable: Awareness;			
Sr. No.	Variables	Co-efficients of estimates	'p' values
1.	Constant	-1.099	0.101
2.	EDN	0.460*	0.082
3.	EXTN	0.153	0.350
4.	EXP	-0.006	0.820
5.	NEWS	0.308	0.367
6.	Social	0.831**	0.020
7.	Log likelihood function	-99.40	

Note: * and ** denote significant of values at P=0.10 and 0.05, respectively;
Source: Field survey data, 2016

Sr. No.	Particulars of opinion/perception	Frequency	Percentage of insured farmers
1.	Motivation		
	Banks' compulsion	91	57.00
	Financial security	54	33.50
2.	Both	15	09.50
	Coverage of crop under weather based crop insurance		
	Adequate coverage	57	35.41
3.	Inadequate coverage	103	64.59
	Do you feel WBCIS is good measure against risk and uncertainty		
	Yes	123	77.08
4.	No	37	22.92
	Premium rate		
	Reasonable	53	33.00
5.	High	107	67.00
	Low	0.0	00.00
	Compensation payment		
6.	Timely	106	66.25
	Delay	54	33.75
	Level of satisfaction		
7.	Yes	65	40.62
	No	80	50.00
	No response	15	9.38

Source: Field survey data, 2016

Table 5 : Non- insured farmer's perception towards weather based crop insurance			(n=80)
Sr. No.	Response for not availing the WBCIS	Frequency	Percentage of non-insured farmers
1.	Level of farmers		
	Only for large farmers	57	71.25
	Only for small and medium farmers	08	10.00
2.	All type of farmers	15	18.75
	Publicity towards insurance scheme		
	Adequate	28	35.00
3.	Inadequate	52	65.00
	Premium paying capacity		
	Yes	53	66.25
4.	No	27	33.75
	Lack of faith in scheme / agency		
	Yes	70	87.50
	No	10	12.50

Source: Field survey data, 2016

Table 6 : Perception of farmers about risk reduction in agriculture			
Sr. No.	Perception	Frequency	Percentage
1.	Providing crop/livestock insurance (A)	46	19.16
2.	Providing relief fund at disaster times (B)	74	30.85
3.	Providing technology, input, credit, etc. (C)	15	6.30
4.	A and B	08	3.35
5.	B and C	11	4.50
6.	A and C	09	3.75
7.	All of the three (A, B and C)	24	10.00
8.	No idea	53	22.09
9.	Total	240	100.00

Source: Field survey data, 2016

Around (66%) of farmers also opined that they are ready to pay existing premium rate if service be provided adequately and promptly.

Farmer's perception about risk reduction in agriculture :

Perceived farmers about risk reduction in agriculture were presented in (Table 6). Nearly about (31 %) of the farmers perceived that Government relief measures/ funds provided at the time of natural calamity/ disasters (drought, floods and cyclone) helps for reducing risks in agriculture. About (22 %) of farmers were unresponsive towards the problem of statement and the perception about crop/livestock insurance was reported by about (19 %) of the sample farmers in study area. Little more than 6 % of farmers opined that providing technology and inputs was crucial for risk reduction in agriculture.

Conclusion :

Weather Based Crop Insurance Scheme (WBCIS) has already made dent in North Karnataka. The large numbers of farmers (76%) are aware about insurance scheme particularly The large holding farmers are much more aware as compared to small holding farmers. Probit Model has revealed that participation in social programme and education level will enhance the farmer's awareness about the scheme in the study area. Most of insured farmers perceived that bank compulsion was the reason for joining insurance scheme. Non-insured farmers (71.25%) opined that insurance is meant only for large farmers. Nearly 20% of interviewed farmers perceived that risk in agriculture could be overcome by insurance whereas 30% of farmers perceived that government needs to instigate the relief measures and provide funds at the time of disaster to protect farmers from crop losses.

The study makes it clear distinctly that farmers are really more interested towards WBCIS scheme but need more innovative products and its benefits, having minimum human interventions. There is also need for appropriate stakeholders interface and capability building initiatives from government/ private side to enhance adoption of insurance scheme and its ultimate reach to the target groups and thereby speedy progress of the agricultural sector.

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