Research Article

Factors affecting crop insurance adoption decisions by farmers in Tamil Nadu

■ **V. KARTHICK AND K. MANI**

SUMMARY : In India agriculture is affected by natural calamities and man-made disaster. It prevents the farmers from crop cultivation. Hence, there is need to protecting the farming community through appropriate measures. One such measure is crop insurance. The present study assessed the determinants of crop insurance purchase decisions by the farmers. Age of the farmer, access to credit and education of the farmer were the important determinant of crop insurance. Lack of crop diversification and fear among the farmers about sure of income loss were the other factor responsible for adoption of crop insurance.

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BACKGROUND AND OBJECTIVES

In India, agricultural production and the resulting farm income are affected by natural events. Floods may wash away the growing fields, droughts may wither plants, diseases may attack during crop growth etc., adversely affect the crop production. All these result in uncertainties in both crop area and yield(Raju and Chand, 2008).Under the situation of risks and uncertainties in agriculture; a farmer hesitates to take decisions related to adoption of new technologies, cultural practices and use of adequate quantities of various costly inputs (Rathore *et al.,* 2011). This in turn affects farm production and farm economy. Hence, there is a need to stabilize and protect farm economy through adoption of appropriate measures.One such measure is crop insurance, which not only protect farm economy from the adverse effects of crop failure but also acts as an incentive to the farmers to shoulder risk of using new technology for improving the well-being of the farmers and stabilizing the agricultural output (Gondalia *et al.,*2008). Realizing the importance of crop insurance as a tool for managing risk and uncertainties in agriculture, the present study was conducted with specific objective to identify factors which are influencing to purchase of crop insurance products by farmers.

RESOURCES AND METHODS

This study was conducted in Southern Zone of Tamil Nadu, which is highly vulnerable to climate change and variability (Palanisamy *et al.*, 2009). In Southern Zone Pudukkottai, Virudhunagar and Sivagangai districts were selected purposively to represent the National Agricultural Insurance Scheme (NAIS), Weather Based Crop insurance scheme (WBCIS) and Modified National Agricultural Insurance Scheme (MNAIS) based on maximum number of farmers enrolled under crop insurance scheme during 2011-12. One block was selected purposively from each district based on maximum number of farmers enrolled for the crop insurance scheme. A total of 270 farm households were randomly interviewed at the rate of 90 per district comprised of 60 adopter and 30 non-adopter. The primary data were collected from the farmers in the selected districts relate to the 2011-2012 production year. Descriptive statistics (mean, frequency, percentage and count) were usedto

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characterize socio-economic variables of farmers.

The probit model was employed to study the factors influencing the adoption crop insurance schemes. It is assumed that the decision of ith farmer to participate in crop insurance or not depended on an Unobservable Utility Index I_i (also known as latent variable), that is determined by one or more explanatory variables. In general, the index I_i is expressed as follows:

$$I_i = f(X) + u_i$$

where, X is a vector of explanatory variables.*The model used in this study is given below.*

$$I_i = {}_1 + {}_2X_1 + {}_3X_2 + {}_4X_3 + {}_5X_4 + {}_6X_5 + {}_7X_6 + e$$

where, $I_i = Y = 1$, if the farmer adopt in crop insurance;0 otherwise. Explanatory variables used in the analysis areX_1(land holding in hectare), X_2 (access to credit 1; otherwise 0), X_3(age in years), X_4 (education in years), X_5 (access to non-farm income 1; otherwise 0) and X_6 (access to irrigation 1; otherwise 0).

Garrett ranking technique was used to rank the other important qualitative factors apart from those included in probit model in adoption of crop insurance.

OBSERVATIONS AND ANALYSIS

The results of the present study as well as relevant discussions have been presented under following sub heads:

Determinants of adoption of crop insurance :

The probit regression was performed to identify the factors that determine the adoption of crop insurance schemes/products. The estimates of the probit model for NAIS, WBCIS and MNAIS have been presented in Table 1. The estimates from the probit model suggest that the participation in crop insurance in all the three schemes were significantly higher for those who had access to loan. It is because crop insurance scheme is being implemented through cooperative and commercial banks, which had higher influence on adoption of crop insurance by those who were all availing institutional credit. Farmers age had significant and positive influence, on adoption of crop insurance in NAIS and WBCIS scheme. Since age old farmers are more experienced in farming and they were exposed to occurrence of risk and uncertainty in crop cultivation in the past, which influenced them to go for adoption of crop insurance to avoid income loss. Education had positive and significant influence on adoption of insurance in all the schemes. Educational attainment may also positively influence farmers participation decision in all the schemes. Education increases one's ability to receive, decode, and understand information relevant to making innovative decisions.It reflects that the educated farmers are better informed about the insurance

Table 1 : Probit regression co-efficients of determinants of adoption of NAIS, WBCIS and MNAIS

Variable	NAIS	WBCIS	MNAIS
	Co-efficient	Co-efficient	Co-efficient
Intercept	-3.51 (0.42)	-4.036 (0.579)	-3.22 (0.39)
Land holding (hectare)	-0.015 (0.042)	0.035 (0.038)	0.085 (0.04)
Access to credit	0.465*** (0.131)	0.392** (0.138)	0.458** (0.157)
Age	0.014*** (0.005)	0.023** (0.008)	0.009 (0.006)
Education	0.040*** (0.015)	0.056** (0.019)	0.035** (0.013)
Access to non-farm income	0.183 (0.200)	0.219 (0.180)	0.125 (0.216)
Access to irrigation	-0.051 (0.194)	-0.191 (0.107)	-0.34** (0.114)
Chi-square	213.96**	216.02**	213.94**
No of observation	90	90	90

* and ** Indicate significance of value at P=0.05 and 0.01, respectively; Figures in the parenthesis indicate standard error of the coefficients

Table 2: Factors influencing the adoption of NAIS, WBCIS and MNAIS

Sr. No.	Particulars	NAIS (n=60)		WBCIS (n=60)		MNAIS (n=60)	
		Mean score	Rank	Mean score	Rank	Mean score	Rank
1.	Lack of crop diversification	61.62	1	30.00	6	53.08	2
2.	Sure of loss due to adverse climatic condition	54.02	2	62.53	1	60.92	1
3.	Aware of the benefits of insurance	47.07	3	49.78	3	‡	‡
4.	Mandatory for those who availed crop loan	39.97	4	55.25	2	42.50	4
5.	Encouraged by experienced farmers	37.52	5	42.67	4	34.57	5
6.	Easy access to loan	36.17	6	35.02	5	32.56	6
7.	Financial security	‡	‡	‡	‡	50.52	3

agencies, schemes and theircharacteristics and also the costs and benefits associated with insurance.The farmers of the region irrigated by canal/ tank were less likely to participate in the programme which was basically due to the fact that the likelihood of occurence of risk was less in such regions compared to that in the rainfed region. Access to irrigation was non-significant in NAIS and WBCIS districts whereas significant and negatively influenced in MNAIS districts.

There were many other important qualitative factors apart from those included in probit model, that influenced the adoption of crop insurance scheme. Crop insurance forms a great support to resource poor farmers who have no alternatives other than borrowing under adverse situations. Eventhough the crop insurance scheme is in operation for a long time, there exists many speculations and scepticism among farmers about the scheme. Though the benefits of the scheme is well known, it still have not acheived the expected coverage either from the point of view of implementing agency or the beneficieries. It means that realisation of financial benefits out of the scheme is not the sole factor governing the adoption of crop insurance. Instead, there must be some other factors which might influence the adoption. The factors influence the adoption of crop insurance was identified and presented in Table 2.

The foremost important factor that influenced the adoption of NAIS was, lack of crop diversification. Paddy was the only crop cultivated under rainfed condition in the study area during *Rabi* season. The main source of irrigation was tank water and soil was sandy costal alluviam which can withhold the rain water upto 10-15 days. In this field condition, growing paddy crop alone was possile. Farmer's fear about crop loss due to advers climatic condition (either flood or drought or pest and diseases) influenced the crop insurance adoption. The next factor that influenced the adoption of crop insurance was awareness about the benefits of adopting crop insurance. Farmers felt that adopting crop insurance would minimise income loss occurred due to adverse weather events, pest and disease and so on.

The most important factor to adopt crop insurance in WBCIS was fear among the farmers about the definite loss from crop cultivation. Farmers depended mostly on institutional credit for crop cultivation.At present service for insurance to loanee farmers is provided by the concerned institution like Co-operative society or Commercial bank.

Those farmers who avail loans from the cooperative banks compulsory come under insurance coverage. The other factors influencing the crop insurance purchase decisions were awareness of benefits from purchase of insurance, easy access to loan and lack of crop diversification.

The MNAIS farmers fear that loss in income due to crop failure (either drought or flood) were the important factor influencing the farmers to adopt crop insurance. Farmers in the study area cultivate paddy, chilies in larger area and cotton in smaller area under rainfed condition if residual soil moisture were available. In a situation of drought farmers failed to cultivate crop and invasion of prosopis occupies the cultivable land and makes the land unfit for crop cultivation. Hence, farmers go for adoption of crop insurance to avoid income loss due to lack of crop diversification. Adoption of crop insurance offered financial security (*i.e.*, the indemnity that could be received in case of financial loss due to adverse weather parameters). Other factor responsible for adoption of crop insurance was mandatory for those who avail crop loan, easy access to loan and encouragement from experienced farmers.

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REFERENCES

Gondalia, V.L., Khuni, K.A. and Vekariya, S.B. (2008). Impact and progress of crop insurance programme in Gujarat State. *Agric. Situ. in India,* **50** (4):19-24.

Palanisami, K., Paramasivam, P. Ranganathan, C.R., Aggarwal, P.K. and Senthilnathan, S. (2009). Quantifying vulnerability and impact of climate change on production of major crops in Tamil Nadu, India, in: Taniguchi, M., W. C. Burnett, Y. Fukushima, M. Haigh and Y. Umezawa (Ed.,), "From headwaters to the ocean: *Hydrological changes and watershed management*, London". Taylor and Francis Group, LONDON, U.K, ISBN 978-0-415-47279-1:509-514.

Raju, S.S. and Chand, R. (2008). A study on the performance of national agricultural insurance scheme and suggestions to make it more effective. *Agric. Econ. Res. Rev*., **21**(1): 11-19.

Rathore,Vikram Singh, Burarka, S.S. and Jain, H.K. (2011). Performance of crop insurance scheme in Udaipur district of Rajasthan, *Agric. Econ. Res. Rev*., **24** (1): 25-35.

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