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### An Observational Study on Perception of Efficacy of Crop Insurance among the Farmers of a Community Development Block in the State of West Bengal

Sumita Saha

Department of Business Management, University of Calcutta, Kolkata, West Bengal, India

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Corresponding Author: Sumita Saha

#### Abstract

Crop insurance is a formal mechanism of risk management to farmers exposed to a similar type of risk in agricultural production. It is a means to protect the cultivators against financial loss on account of anticipated crop loss which might arise out of uncontrollable natural calamities such as natural fire, weather, floods, pests, diseases etc.

In West Bengal, various crop insurance schemes have been implemented so far. The common aim of the schemes is to provide financial support to farmers in the event of crop failure and stabilize farm production and income of the farming community. This is the motivation behind the study. The study has been conducted among farmers of Hooghly district in West Bengal to understand their perception of efficacy of crop insurance schemes. Respondents include

both insured and non-insured farmers. The mean age of the farmers with crop insurance was  $43.18 \pm 16.13$  years and the mean age of the ones without crop insurance was  $44.22 \pm 18.07$  years respectively ( $p=0.62$ ). All respondents were males with full ownership of farms. The mean size of the farms was  $5.95 \pm 3.28$  bigha. A total number of 60 farmers were selected randomly out of which 30 farmers were with crop insurance and rest 30 were without crop insurance.

Among the risk management strategies adopted for the destruction of crops, sale/ mortgage of land, sale of livestock and government relief were higher among non-insured farmers as compared to insured farmers ( $p>0.05$ ).

**Keywords:** Crop Insurance, Insured, Financial Support, Perception of Efficacy, Non-insured Farmers

#### Introduction

Crop insurance is a formal mechanism of risk management to farmers exposed to a similar type of risk in agricultural production. It is a means to protect the cultivators against financial loss on account of anticipated crop loss due to uncontrollable natural calamities such as natural fire, weather, flood, pests and diseases (crop-yield insurance). It may also be due to a protection against loss in revenue due to decline in prices of crops (crop revenue insurance). In India, full subsidy is provided by the Government against most of the notified crops in notified areas.

There had been a number of experimental efforts to introduce crop insurance in the country on a large scale. The first ever full-fledged crop insurance scheme, Comprehensive Crop Insurance Scheme (CCIS) was introduced in 1985. National Agricultural Insurance Scheme (NAIS) was launched in 1999 – 2000. Weather-based crop insurance scheme (WBCIS) was launched in 2007 to combat parametric weather risks. National Crop Insurance Programme (NCIP), a restructured crop insurance scheme was introduced in 2013 – 14 by merging all other schemes existing then.

In Kharif 2016, Pradhan Mantri Fasal Bima Yojana (PMFBY), was launched by the Government of India with improvised features such as additional risk cover, low premium insurance cover, cover for selected crops etc. In West Bengal it has been rechristened as Bangla Fasal Bima Yojana. In Kharif 2019, the Government of West Bengal launched Bangla Shasya Bima (BSB), which provides 100% subsidy on notified crops in notified areas except potato and sugarcane for which 4.85% of the premium has to be borne by the farmers.

In the holistic view and system-thinking approach, efficacy implies whether the means employed enable realization of goals (Hickey & Brosnan, 2012; Nardi *et al.*, 2013). In the context of crop insurance, therefore, its efficacy is obtained when the farm income and production of farming community is stabilized, financial support can be provided to the farmers in times of crop failure, farmers can be facilitated for the adoption of risky but remunerative technology, resources can be optimally allocated in the production process, farmers can be encouraged to adopt progressive farming practice and higher technology in

agriculture and provide significant benefits to the entire community through spill-over effect (Dandekar, 1985) [4]. The flagship crop insurance policy of Government of West Bengal, Bangla Shasya Bima (BSB), launched in kharif 2019, aims towards execution of three more tasks in addition to supporting of sustainable production in agriculture – covering all farmers including sharecroppers and tenant farmers growing notified crops in notified areas, fast settlement of claims using rainfall data and remote sensing technology and rationalization of claims assessment procedure and actuarial pricing of crops (Operational Guidelines for implementation of Bangla Shasya Bima, Department of Agriculture, Government of West Bengal). This study aims towards assessment of the motivations of the farmers towards various crop insurance schemes. The study was conducted among the farmers of Hooghly district in West Bengal to understand their perception of efficacy. Both insured and non-insured farmers were included in the study. Different aspects such as pattern of financial security, repayment of outstanding debt, improved use of new technology and others were assessed from the respondents.

The objectives of the study are:

1. To understand the perception of farmers (both insured and non-insured) regarding improvement of the use of inputs, savings, debt-servicing, yield, quality of yield and cultivation of risky but profitable crops.
2. To assess the improvement of the general condition of the farmers after adopting crop insurance and without adopting it.

### Materials and Methods

The study was conducted in different blocks of Hooghly district of West Bengal. Required information were collected using well designed questionnaire from the insured and non-insured farmers. Insured farmers belonged to Mohanod, Jarura, Polba and Dadpur villages of Polba-Dadpur Mouza. Non-insured farmers were from Maheshwarbati-Kashwara and Biharipally villages of Ranibheri Mouza and Purba Jolar Bheri, Dakatia Bheri villages of Birendra Nagar Mouza.

The study was conducted during the period May to August 2022 (covering Rabi 2022-23 crop insurance season). All insured and non-insured farmers were actively involved in cultivation of paddy, potato, pulses, oilseeds and vegetables. Snowball sampling method was used to select the sample. Lists containing names of insured farmers from different villages within the block were provided by the Co-operative society (Shomobai Samiti). A total of sixty respondents were selected randomly out of which 30 were with crop insurance and 30 farmers were without crop insurance.

The questionnaire for data collection is developed on the basis of the objectives of crop insurance implementation (Dandekar, 1985) [4]. The objectives of crop insurance implementation relate to provision for financial support to the farmers in the event of crop failure, stabilization of farm production and income of the farming community, optimal allocation of resources in the production process, facilitation of farmers in adoption of risky but remunerative technology so that cultivation might lead to increased income, encouragement of farmers to adopt progressive farming practice and higher technology in agriculture, and, lastly provide benefits not only to the insured but also to the entire

community through spill-over effect.

The questionnaire contains the following sections:

- (i) Demographic characteristics (ii) causes of crop damage (iii) risk-management strategy (iv) sources of information on crop insurance implemented and associated details (v) motivators/non-motivators (vi) perception on extent improvement of different input-related parameters (vii) perceptions on extent of improvement of socio-economic conditions.

### Statistical Analysis

Statistical Analysis was performed with help of Epi Info (TM) 7.2.2.2 EPI INFO is a trademark of the Centers for Disease Control and Prevention (CDC).

Descriptive statistical analysis was performed to calculate the means with corresponding standard deviations (s.d.). Test of proportion was used to find the Standard Normal Deviate (Z) to compare the difference of proportion and Chi-square ( $\chi^2$ ) test was performed to find the association. T-test was used to compare the means of the two groups. Fisher Exact test was used where Chi-square ( $\chi^2$ ) test was not applicable.  $p < 0.05$  was taken to be statistically significant.

### Results

30 (50.0%) of the farmers were with crop insurance (Group-CI) and 30 (50.0%) of the farmers were without crop insurance (Group-NCI). Thus, the farmers of the two groups were in the ratio 1:1.

The mean age of the farmers of CI and NCI group were  $43.18 \pm 16.13$  years and  $44.22 \pm 18.07$  years respectively ( $p = 0.62$ ). All the farmers of the two groups were males ( $p = 0.99$ ). Thus, the farmers of the two groups were matched for their age and gender. However, the mean ( $\pm$ s.d.) size of farm of the farmers without crop insurance was significantly higher than that of the farmers with crop insurance ( $p < 0.0001$ ) (Table 1).

The farms were fully owned by the farmers of the two groups ( $p = 0.99$ ). There were no significant differences in the types of crop cultivated except for potato grown by the farmers of the two groups ( $p > 0.05$ ). Cultivation of potato was significantly higher in case of farmers with crop insurance (100.0%) than the farmers without crop insurance ( $p < 0.0001$ ). There were no significant differences in the reasons of crop destruction in the field due to excessive deficit rainfall and storm ( $p > 0.05$ ). However, crop destruction in the field due to unseasonal heavy rainfall and pest were significantly higher among the farmers with crop insurance than the farmers without crop insurance ( $p < 0.001$ ). There were no significant differences in sale/mortgage of land, sale of livestock, government relief as the risk management strategy adopted post destruction of crops of the farmers of the two groups ( $p > 0.05$ ). Loan from co-operative bank and adoption of crop insurance were significantly higher among the farmers with crop insurance than the farmers without crop insurance ( $p < 0.001$ ). (Table 2)

The mean ( $\pm$ s.d.) sum assured, amount of monthly premium and percentage of total claim received by the farmers with crop insurance are depicted in Table 3.

The responses of the farmers with crop insurance and without crop insurance are depicted in Tables 4 - 9.

**Discussion**

Chakraborty *et al.* conducted a study to assess the level of awareness of the farmers regarding crop insurance in the district of Cooch Behar, West Bengal. As per the study the mean level of awareness on the type of insurance available was very low. Also, the mean level of awareness with respect to different components associated with insurance like the total extent to which the product ensures the coverage, the amount of premium required to purchase the particular product, the last date till which the insurance can be done, the crop insurance procedure in details and the process by which the insurance product can be purchased was moderate. It was concluded that majority of the respondents were aware about the crop insurance but the majority of respondents were not aware of the contacts of those institutions which would help them to resolve the above-mentioned issues properly. However, the study revealed that the higher satisfaction level brought more awareness among the respondents.

Mahajan *et al.* in their study mentioned that since 1972 many schemes of crop insurance had been launched in India which failed to influence the farmers and share the risk of farmers. As a result, some farmers committed suicide due to lack of risk management. National Agricultural Insurance Scheme (NAIS) introduced crop insurance for Rabi in 1999-2000 but it also failed to meet the farmer’s expectations. Modified National Agricultural Insurance Scheme (MNAIS) introduced on a pilot basis with covers for cyclones and prevented sowings failed to be an effective crop insurance program.

The study by Aditya *et al.* found that the adoption of crop insurance by farmers was very poor with only 4.80% and 3.17 % of the sample farmers insuring their crops in Kharif and Rabi season, respectively. The insurance was bundled with credit and the extent of voluntary insurance was very low (0.73% and 0.38 % in Kharif and Rabi respectively) for insured farmers. It was found that educated farmers with better extension contact were more likely to insure their crops. Land holding size and subsidy on premium was found to increase the probability of farmers to adopt crop insurance. Farmers belonging to backward castes and tenants were less likely to purchase crop insurance. Impact of crop insurance purchase on the value of output, crop production expenses and investments of rice growers were inconclusive from their study. It was concluded that the extension mechanism needed to play a pivotal role in creating awareness about crop insurance.

Chakraborty *et al.* mentioned that a poor level of awareness related to the crop insurance scheme was prevalent in a district of West Bengal. The result of this study also revealed that 93.3% came to know about crop insurance from bank representatives.

In the present study the average percentage of adoption of crop insurance for Rabi crop was 44.4% which was much higher as mentioned by Aditya *et al.* 73.3% of the farmers confirmed that crop insurance largely gives protection against risk. 66.7% of them believed partially it helped to generate revenue through crop production. 100.0% of the insured farmers partially or fully agreed that it helped in the reduction in the amount of outstanding debt. 86.7% of them were benefited after having crop insurance. All these were in favor of crop insurance in contrast to findings by Mahajan *et al.* However, 75.0% of the insured farmers opined that extent of crop failure was more than amount of claim approved.

**Conclusion**

The results of this study revealed that adoption of crop insurance ensured the adoption of new technologies in agriculture and improvement of living standards of the farmers with respect to consumption expenditure, use of medicines and education level of their children. It was found from the results that the non-insured farmers had to borrow money from the self-help groups.

**Limitation**

Due to constraints of financial assistance and manpower the study was conducted on 60 farmers of 30 each with crop insurance and without crop insurance. Studies including considerable higher number of farmers may be conducted to have a better knowledge.

**Recommendation**

The results of this study revealed that the adoption of crop insurance may be encouraged by conducting awareness programme among the farmers. All-out effort is being made by the State Government to include sharecroppers and tenant farmers in the flagship crop insurance policy - Bangla Shasya Bima (BSB). More of such effort towards mass inclusion and increasing extension programmes will definitely lead to universal coverage through large scale improvement of awareness level among farmers.

**Annexure**

**Table 1:** Comparison of demographic parameters and size of firm of the farmers with crop insurance and without crop insurance

Demographic parameter/ Size of firm	Farmers with crop insurance (n=30) (mean±s.d.)/ (number)	Farmers without crop insurance (n=30) (mean±s.d.)	p-value
Age (years)	43.18±16.13	44.22±18.07	0.50 NS
Gender (Male:Female)	30:0	30:0	0.99 NS
Size of firm (bighas)	4.51±3.38	7.40±2.49	<0.0001 S

S-Statistically significant

NS-Statistically not significant

**Table 2:** Comparison of responses of the farmers with crop insurance and without crop insurance

Responses	Farmers with crop insurance (n=30)		Farmers without crop insurance (n=30)		p-value
	Number	%	Number	%	
<b>Ownership of firm</b>					
Fully owned	30	100.0	30	100.0	0.99 NS
<b>Type of crop cultivated</b>					
Cereals	27	90.0	23	76.7	0.16 NS
Pulses	4	13.3	3	10.0	0.68 NS

Oilseeds	10	33.3	12	40.0	0.59 NS
Potato	30	100.0	18	60.0	<0.0001 S
Vegetables	1	3.3	0	0.0	0.50 NS
Sugarcane	8	26.7	18	60.0	0.009 S
<b>Reason of destruction of crop in the fields</b>					
Excessive deficit rainfall	20	66.7	23	76.7	0.39 NS
Unseasonal heavy rainfall	28	93.3	20	66.7	0.009 S
Storm	12	40.0	6	20.0	0.09 NS
Pest attack	11	36.7	0	0.0	0.0001 S
<b>Risk management strategy adopted for the destruction of crops</b>					
Sale mortgage of land	4	13.3	9	30.0	0.11 NS
Loan from bank co-operative	28	93.3	1	3.3	<0.0001 S
Sale of livestock	0	0.0	4	13.3	0.056 NS
Government relief	9	30.0	14	46.7	0.18 NS
Crop insurance	29	96.7	0	0.0	<0.0001 S

**Table 3:** Some parameters related to crop insurance of the farmers with crop insurance

Parameters	Mean±s.d
Sum assured (INR)	87870.34±63654.43
Premium (INR)	4456.74±3144.54
Total claim received (%)	18.80±15.56

**Table 4:** Responses of the farmers with crop insurance (continued)

Responses of the farmers with crop insurance	Number	%	p-value
<b>Crop insurance schemes adopted in the previous years</b>			
Government Crop Insurance Scheme	30	100.0%	<0.0001 S
Other Crop Insurance Scheme	0	0.0%	
Weather-based Crop Insurance Scheme	0	0.0%	
<b>Number of times claims received</b>			
Once	15	50.0%	0.99 NS
Twice	15	50.0%	
<b>Source of information regarding crop insurance</b>			
From friends/neighbor	5	16.7%	<0.0001 S
From progressive farmers	0	0.0%	
From bank representative	28	93.3%	
Radio	0	0.0%	
Newspaper	8	26.7%	
<b>Motivation of taking up the crop insurance</b>			
<b>Compulsion from banks</b>			
Not at all	16	53.3%	
To some extent	2	6.7%	
Largely	12	40.0%	
<b>Crop insurance gives protection against risk</b>			
Not at all	1	3.3%	<0.0001 S
To some extent	7	23.3%	
Largely	22	73.3%	
<b>Peer-group compulsion</b>			
Not at all	26	86.7%	<0.0001 S
To some extent	0	0.0%	
Largely	4	13.3%	
<b>Following fellow farmer</b>			
Not at all	26	86.7%	<0.0001 S
To some extent	3	10.0%	
Largely	1	3.3%	

**Table 5:** Responses of the farmers with crop insurance (continued)

Responses of the farmers with crop insurance	Number	%	p-value
<b>Decision to buy crop insurance improve</b>			
<b>The amount of high-yielding variety seeds used in the cultivation process</b>			
Fully disagree	4	13.3%	<0.0001 S
Partially disagree	0	0.0%	
Partially agree	7	23.3%	
Fully agree	19	63.3%	
<b>Use of fertilizer in cultivation</b>			
Fully disagree	0	0.0%	<0.0001 S
Partially disagree	1	3.3%	
Partially agree	8	26.7%	
Fully agree	21	70.0%	
<b>Use of new technology in agriculture</b>			
Fully disagree	0	0.0%	<0.0001 S
Partially disagree	0	0.0%	

Partially agree	12	40.0%	
Fully agree	18	60.0%	
<b>The amount of land cultivated in total</b>			
Fully disagree	16	53.3%	<0.0001 S
Partially disagree	0	0.0%	
Partially agree	4	13.3%	
Fully agree	10	33.3%	
<b>The amount of revenue from yield</b>			
Fully disagree	2	6.7%	<0.0001 S
Partially disagree	3	10.0%	
Partially agree	20	66.7%	
Fully agree	5	16.7%	
<b>The amount of savings</b>			
Fully disagree	2	6.7%	<0.0001 S
Partially disagree	0	0.0%	
Partially agree	24	80.0%	
Fully agree	4	13.3%	
<b>The reduction in the amount of outstanding debt</b>			
Fully disagree	0	0.0%	<0.0001 S
Partially disagree	0	0.0%	
Partially agree	13	43.3%	
Fully agree	17	56.7%	

**Table 6:** Responses of the farmers with crop insurance (continued)

Responses of the farmers with crop insurance	Number	%	p-value
<b>The appropriate new technology adopted for farming after taking up crop insurance scheme</b>			
Resource conserving technology (zero and reduced tillage, crop rotation, green fertilizer)	8	26.7%	<0.0001 S
High-yielding technologies (system of rice intensification)	11	36.7%	
Post-harvest technologies (cold storage, processing units etc.)	28	93.3%	
Climate resilient technologies seed drill, seed broadcast, hand ridges, dibblers etc	3	10.0%	
<b>Drawn benefits in the following areas due to introduction of new technology</b>			
<b>Yield of crops</b>			
Not at all	2	6.7%	<0.0001 S
Partially	14	46.7%	
Much	14	46.7%	
<b>Quality of yield</b>			
Not at all	4	13.3%	<0.0001 S
Partially	8	26.7%	
Much	18	60.0%	
<b>Input per unit area</b>			
Not at all	6	20.0%	<0.0001 S
Partially	7	23.3%	
Much	17	56.7%	
<b>Manpower required</b>			
Not at all	9	30.0%	<0.0001 S
Partially	15	50.0%	
Much	6	20.0%	

**Table 7:** Responses of the farmers with crop insurance (continued)

Responses of the farmers with crop insurance	Number	%	p-value
<b>Increase of yield per unit (farm productivity) on taking up crop insurance</b>			
Not at all	3	10.0%	<0.0001 S
Partially	13	43.3%	
Much	14	46.7%	
<b>Improvement of increase in total cultivable land due to crop insurance uptake</b>			
Not at all	19	63.3%	<0.0001 S
Partially	5	16.7%	
Much	6	20.0%	
<b>Spill-over effect on livestock and growth of other crops due to crop insurance uptake for a particular crop.</b>			
Not at all	10	33.3%	0.99 NS
Partially	10	33.3%	
Much	10	33.3%	
<b>Shift to cash crops from food crops due to implementation of crop insurance scheme?</b>			
Not at all	3	10.0%	<0.0001 S
Partially	17	56.7%	
Much	10	33.3%	
<b>Shift from low-risk, low-return crop to high-risk, high-return crops</b>			
Not at all	3	10.0%	<0.0001 S
Partially	15	50.0%	
Much	12	40.0%	

**Table 8:** Responses of the farmers with crop insurance (continued)

Responses of the farmers with crop insurance	Number	%	p-value
<b>Benefited after having crop insurance</b>			
<b>Spend better for family consumption</b>			
Not at all	4	13.3%	<0.0001 S
Partially	20	66.7%	
Much	6	20.0%	
<b>Purchase medicines with ease</b>			
Not at all	5	16.7%	<0.0001 S
Partially	18	60.0%	
Much	7	23.3%	
<b>Spend properly on education of children</b>			
Not at all	2	6.7%	<0.0001 S
Partially	15	50.0%	
Much	12	40.0%	
No answer	1	3.3%	
<b>Benefit of peer group sold his farmland and switched over to a full-time non-agricultural job</b>			
Yes	12	40.0%	<0.0001 S
No	18	60.0%	
<b>Reason for such an action</b>			
<b>Extremely low yield and inability to pay for premium</b>			
Yes	5	41.7%	
No	7	58.3%	
<b>Crop failure and inability to get claims fulfilled</b>			
Yes	9	75.0%	<0.0001 S
No	3	25.0%	
<b>Extent of crop failure was more than amount of claim approved</b>			
Yes	9	75.0%	<0.0001 S
No	3	25.0%	

**Table 9:** Response of farmer without crop insurance

Self-Help Group	Number	%	p-value
Yes	21	75.0%	<0.0001 S
No	7	25.0%	
<b>Total</b>	28	100.0%	

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