

## Crop Insurance: An Empirical Study on Awareness and Perceptions

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### Abstract

Universally agriculture is perceived to be synonymous with risk and uncertainty. Crop insurance is one alternative to manage risk in yield loss by the farmers. It helps in stabilization of farm production and income of the farming community. As such it is a risk management alternative where production risk is transferred to another party at a cost called premium. The on going National Agricultural Insurance Scheme is a good step forward to insure risk of millions of farmers whose livelihood depends on the pattern and distribution of monsoon rain in India. However, the penetration of crop insurance is found to be very less. This study is an attempt to understand the existing scenario of crop insurance in India with a special reference to Gujarat. The study empirically checks upon the awareness level of farmers in Anand district towards this product. The paper further examines the perception of those who have availed or not availed crop insurance in various villages of Anand district. The study concludes with various suggestions for increasing the awareness level of the farmers for ensuring better penetration of crop insurance in Anand district.

**Key Words:** Agriculture, Crop Insurance, National Agricultural Insurance Scheme, Farmers' Awareness

### Introduction

The enterprise of agriculture is subject to many uncertainties. Yet, more people in India earn their livelihood from this sector, than from all other economic sectors put together. According to the report of working group on risk management in Agriculture for the eleventh five year plan (2007-12), 75% of all rural poor, are in households that are dependent on agriculture, in some way or other. Households that were self-employed in agriculture, account for 28% of all rural poor, while households that were primarily dependent on agriculture as labour, account for 47% of all rural poor.

Agricultural production is an outcome of biological activity which is highly sensitive to changes in weather. The erratic and uneven distribution of monsoon rains perpetuated yield/price volatility and hence increased farmer's exposure to risk and uncertainty. In this scenario of high risk and uncertainty of rain fed agriculture, allocating risk is an important aspect of decision making to farmers (Reddy, 2004). The risk burden of the farmers can be reduced through crop insurance, which is primarily a way of protecting farmers against the element of chance in crop production. Crop insurance spreads the crop losses over space and time, provides social security to the farmers, helps in maintaining their dignity, offers self-help, encourages large investments in agriculture for improving crop yield and increasing agricultural production (Singh, 2004).

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Crop insurance not only stabilizes the farm income but also helps the farmers to initiate production activity after a bad agricultural year. It cushions the shock of crop losses by providing farmers with a minimum amount of protection (Raju and Chand, 2008). The basic principle involving crop insurance is that loss incurred by a few is shared by many in the area. Also losses incurred in bad years are compensated by resources accumulated in the good years. Considering the importance of crop insurance to agriculture, the paper makes a systematic attempt to explore the potential of such insurance in various villages of Anand district.

### **Crop Insurance in India**

In US, crop insurance is clearly identified as risk management option. The Non-insured Crop Disaster Assistance Program (NAP), managed by United States Department of Agriculture (USDA) Farm Service Agency, provides financial assistance to producers of non-insurable crops when low yields and loss of inventory occurs due to natural disasters. Multiple Peril Crop Insurance (MPCI) policies are available for most insured crops (Venkatesh, 2008).

In a country like India, where crop production has been subjected to vagaries of weather and large scale damages due to attack of pests and diseases, crop insurance assumes a vital role in the stable growth of the sector. In order to provide a boost to the agriculture in India, a number of experimental crop insurance schemes have been introduced from time to time; such as First individual approach scheme (1972-1978), Pilot Crop Insurance Scheme (1979-1984), Comprehensive Crop Insurance Scheme (1985-1999), Experimental Crop Insurance Scheme (1997-1998), Pilot Scheme on Seed Crop Insurance and National Agricultural Insurance Scheme (1999- 2000 onwards) (Mahajan and Bobade, 2012).

A beginning in crop insurance was made in 1972 by implementing an experimental scheme for Hybrid-4 cotton in a few districts of Gujarat state. This scheme followed the individual approach and uniform guaranteed yield was offered to selected farmers. This scheme continued till 1979 and was phased out, following the assessment that crop insurance schemes based on individual approach are not feasible and economically unviable to implement on a large scale in a large developing country like India (Jain, 2004).

Comprehensive Crop Insurance Scheme (CCIS) for major crops was introduced in 1985, coinciding with the introduction of the Seventh-Five-year Plan and subsequently replaced by National Agricultural Insurance Scheme (NAIS) with effect from 1999-2000. Agriculture Insurance Company of India Limited (AIC) has been formed by the Government of India to serve the needs of farmers better and to move towards a sustainable actuarial regime. AIC has taken over the implementation of NAIS which until FY03 was implemented by General Insurance Corporation of India (Reddy, 2004).

The scheme is available to all States and Union Territories, on an optional basis. A State opting for the scheme will have to continue it, for a minimum period of three years. The scheme is compulsory, for farmers availing crop production loans and voluntary for others. As per the report of working group on risk management in Agriculture for eleventh five year plan (2007-2012), till Rabi 2005-06, NAIS covered 79.16 million farmers for a premium of ₹2,332.50 crores and finalized claims of ₹7,255.75 crores.

While CCIS was restricted only to loanee farmers, NAIS widened the coverage by envisaging voluntary participation of non-loanee farmers. NAIS has enabled farmers to choose indemnity limits of 60%, 80% or 90% of the threshold yields as indemnity limits. The limit of the sum insured was increased to the value of 150% of average yield against payment of an actuarial based premium. Though NAIS was launched to cover the short falls observed in CCIS,

the scheme is far from breaking even or achieving the desired coverage (Pal and Mondal, 2010). The NAIS is considered to be an improvement over the CCIS, but it has simply replaced one flawed scheme with another slightly less flawed one. The main flaws of the NAIS are the goal of financial viability, its mandatory nature, its failure to address adverse selection, arbitrary premiums, and the area approach (Ifft, 2001).

According to the latest data released by ministry of agriculture, crop insurance claims worth of `22,135 crore have been settled till now for 4.86 crore farmers mostly from Andhra Pradesh, Gujarat, Rajasthan, Maharashtra, Bihar and Karnataka. With an insurance claim settlement of `4099 crore, Andhra Pradesh tops list of states getting maximum benefit of the scheme followed by Gujarat (`3917 crore), Rajasthan (`2621 crore), Maharashtra (`1873 crore), Bihar (`1794 crore) and Karnataka (`1635 crore) (Financial Express, 2012).

Regarding the private sector participation in rural insurance, it was observed that companies such as TATA AIG General Insurance, Reliance General Insurance, and HDFC Ergo are involved in selling cattle insurance plans. While for crop insurance, the participation of private players has been very scanty in India. ICICI Lombard pioneered weather insurance space by launching rain fall insurance scheme in 2003 in Andhra Pradesh (Venkatesh, 2008).

## Literature Review

The topic of crop insurance has been widely studied in the domain of agricultural insurance by the academicians. Studies in US for crop insurance are widespread. These studies have focused on several issues particularly the failure of crop insurance programs to perform as expected. Several authors have suggested that this failure is primarily due to problems of moral hazard, adverse selection, and systemic risks (Weaver and Kim, 2002; Chen, 2005; Quiggin et al, 1986, Roberts et al, 2006). In this section, various articles in relation to crop insurance in India have been reviewed.

Pal and Mondal (2010) studied the approaches and challenges for agriculture insurance in India. They advocated peril-indexed insurance and options as a risk management technique aimed at stabilizing the revenue of farmers, which is highly dependent on Indian weather conditions. Like Pal and Modal (2010), Venkatesh (2008) also advocated the use of weather insurance as a panacea to ills of crop insurance. It is prevalent in countries like US, UK and Canada. In India, ICICI Lombard pioneered this insurance as a weather risk mitigation tool. In support of this suggestion, Ifft (2001) recommended use of indexed based contracts such as rain fall contracts where in farmers would be compensated if the rainfall in an area would go below a set level, with varying levels of payment depending upon the level of rainfall.

In a working paper of National Centre for Agricultural Economics and Policy Research (Indian Council of Agricultural Research), Raju and Chand (2008) discussed and explored the problems and prospects of agriculture insurance in the country. They also empirically examined the perceptions of the farmers in Andhra Pradesh regarding the Agricultural insurance. Those who availed crop insurance mentioned financial security as the most important factor for getting their crop insured and wanted quick settlement of claims. The non loanee farmers mentioned lack of awareness as the major reason for not availing such insurance.

Mahajan and Bobade (2012) made an attempt to study the growth and development of NAIS and to examine the important features and performance of NAIS. As per the findings, even after the 10 rears of launching the program, there is lack of awareness of farmers about scheme. Further, NAIS is showing deficit on the ground that the premium received is always less than

claims under NAIS. Singh (2004) traced the history of crop insurance in India and reviewed briefly the methods used for actuarial premium rate making. Singh (2010) gave a historical overview of crop insurance in India and made a comparison between National Agricultural Insurance Scheme and Weather Based Insurance Scheme.

Thus, the review of literature in relation to agriculture insurance in general and crop insurance in particular reflected that majority of the Indian studies were taken up at macro level. They were conceptual in nature and their main emphasis was to highlight the evolution and growth of crop insurance with various government schemes. Very few studies had taken empirical approach to present the perceptions of those who availed or not availed crop insurance. Further, for Gujarat, there are no conceptual or empirical studies which came to the notice of researchers in relation to agriculture or crop insurance. Hence, this study is an attempt to fill the research gap at this level by addressing the awareness and challenges for better penetration of crop insurance in different villages of Anand District.

### **Research Objectives**

Basically, the purpose of undertaking this research was to study the penetration of crop insurance in various villages of Anand district. However, the specific objectives of the study may be described below:

1. To understand the prevailing scenario of crop insurance in India
2. To study the awareness level of the farmers for crop and cattle insurance in Anand district.
3. To analyse the importance of various risk factors and the risk mitigating strategies used by the farmers.
4. To identify the impact of various educational efforts for spreading the awareness for crop insurance in the selected area.
5. To study the reasons for not availing such insurance by the farmers.

### **Research Methodology**

This study exploring the potential of crop insurance in various villages of Anand district is based upon the descriptive research design. The primary data for the study was collected by surveying the farmers in Anand district through a structured questionnaire. It was possible to collect responses from 55 respondents through a snowball sampling method. Farmers from various villages such as Samarkha, Borsad, Navli, Umreth, Davol, Bodal, Borriyavi, Lalpura etc. have been approached for this survey.

The respondents were contacted personally for data collection. The respondents were explained all the questions and these responses were being filled by the researcher in the questionnaire to ensure the accuracy of the data. Students of Anand Institute of Management (Anand) helped the researchers for data collection. These students were explained the objectives of this research and were trained for data collection. The entire survey was carried out from November 2012 to December 2012.

The questionnaire was divided mainly into three parts. The first part included general information such as age, education, occupation and source of income. Second part contains the details of agriculture such as land size, types of crop, financing of input cost, frequency of crop failure and reasons for such failure. Third part analyses the details of crop insurance such as

various risk factors and the risk mitigating strategy used by the farmers, awareness level of farmers, impact of various educational efforts for spreading awareness of crop insurance, satisfaction level of those who have availed crop insurance and the reasons for not availing such insurance.

Information obtained from the farmers was analyzed and interpreted with the help of SPSS 17 and Microsoft excel programmes. For data analysis, frequency distribution, descriptive statistics such as mean and standard deviation were used. Wilcoxon paired sample test was applied to compare the awareness level of farmers for crop and cattle insurance in Anand district.

### Findings and Discussion

The entire survey of the farmers is divided into three parts namely, demographic information, details related to agriculture and details related to crop insurance.

#### Section I Demographic Analysis

**Table 1: Demographic Analysis of Farmers**

Parameters	Critical Statistics	Interpretation
<b>Gender</b>	All 100% respondents were male.	Agriculture being the hardcore and labourious activity is carried out by male.
<b>Age</b>	Mean age of farmers was 49 years. (Youngest farmer-30 years and eldest farmer- 70 years)	Youngsters as well as elders were actively involved in agriculture, which time and again proved to be major occupation of rural patrols.
<b>Education</b>	24% farmers were illiterate, 49% were having education less than HSC and only 27% farmers were educated above HSC.	Despite India being second largest in the field of agriculture, farmers were not educated in the niche area. None of the farmers were found to have any academic qualification or vocational training exclusively targeting agriculture development.
<b>Occupation</b>	All the farmers were involved in farming. 30% farmers made horizontal occupational expansion in the form of cattle rearing and 5% farmers diversified to other activity such as trading of goods.	To generate additional income for subsistence and a substitute for one time money derived from seasonal farming, respondents expanded or diversified to cattle rearing, service and business.
<b>Total yearly income</b>	Mean income was found to be ₹2,85,364, with minimum of ₹40,000 and maximum of ₹20,00,000.	The income was highly skewed with a standard deviation of ₹3.56 lacs. The variation in income was attributed to the land size, auxiliary income source and major income from farming. Statistical mode of ₹500000 showed that farmer's major income was derived from farming activity.

*(Source: Authors' Compilation)*

## Section II Details related to Agriculture

The average land holding by the farmers was observed to be 13 acres with a standard deviation of 14 acres of land. These farmers owned minimum 2.5 acres of land while the maximum was 70 acres. There was a difference of 1 acre between the total land holding and the land used for cultivation.

Multiple responses to the types of crops grown by farmers revealed their varied cropping preferences. 23% of the farmers were engaged in farming of tobacco. Charotar is an important region for growing tobacco in Gujarat. It is a tobacco hub. The farmers of Anand-Kheda district are majorly involved in tobacco farming; as it is a cash crop and tobacco harvesting is easy and financially profitable. However due to the dropping sales in tobacco products, farmers are now shifting to harvest other crops such as rice, wheat, bajra, vegetables and fruits. As per the findings, other than tobacco, the respondents were also growing wheat (22%), bajra (20%), rice (16%), potato (10%) and other vegetables (9%).

Multiple crop cultivation indicates that farmers are taking best advantage of their resources and working harder to earn more. Further, 54% of the farmers were growing only seasonal crops while remaining 46% were farming seasonal as well as non-seasonal crops. Only 4% of the farmers surveyed were engaged exclusively into rain-fed farming. While majority of the farmers (73%) were adopting rain fed as well as irrigated farming. Rain-fed farming is quite risky affair. Irrigated farming provides life line to the crop in terms of unfavourable situation.

Regarding the ownership structure of their farming business, it was reported that 89% of such businesses were privately owned as compared to partnership 11%. In the survey respondents expressed that agriculture was an ancient occupation, carried since the time of their forefathers, thus, majority farmers solely inherited this occupation. About financing the input cost, it was observed that majority of the farmers relied upon their own sources (54%) and families and friends (17%). Majority of the farmers are wise and very cautious to avail loan. Only 29% of the farmers had taken loans either from the bank (25%) or money lenders (4%).

In majority of the cases (54%), the frequency of crop failure was found to be 1 to 2 times in a year. While there were significant number of cases (36%), where the frequency of crop failure was found to be nil. The crop failure was explained by climatic condition (54%), economic reasons (40%) and poor quality of raw material (14%). This clearly indicates that agriculture is a risky business, surrounded many challenges, which needs to be protected through insurance.

## Section III Details related to Crop Insurance

Before assessing the awareness and engagement of the farmers with crop insurance, their perceptions towards various risks that they face and the actions to mitigate such risks were evaluated. The results of the same are produced in table 2 and 3.

As per table 2, the mean values for all the risk factors were above 3.5 except burglary. It means that all these factors were perceived to be relevant for the respondents. Among them, risk related to crop price variability and payments for sold product were perceived to be more important. This reflected the potential of crop insurance.

**Table 2 Descriptive Statistics of Farmers' Perception towards Risk Factors**

Risk Factors	Mean	Standard Deviation
Livestock's diseases	3.76	1.26
Payment for sold products	3.95	0.89
Climate risks	3.64	1.13
Crop Failure	3.73	1.08
Access to market	3.58	0.76
Changes in costs of production	3.64	0.80
Crop price variability	3.98	0.76
Burglary	3.13	0.47

(Source: Authors' Compilation)

**Table 3 Descriptive Statistics of Farmers' Perception towards Risk Management Strategies**

Risk Management Strategies	Mean	Standard Deviation
I would like to mitigate risk by taking insurance.	3.38	0.93
I never worry about the risk.	2.53	1.20
I believe that the risk will be mitigated as when it arises.	2.89	1.05
I undertake savings and maintain cash reserves to mitigate future risk.	4.02	0.76
I produce only for known buyers	2.58	1.10
I levy importance on on-farm enterprises diversification	3.26	0.99
I generate off-farm sources of income to mitigate the risk	3.46	0.86

(Source: Authors' Compilation)

For mitigating such risk factors (table 3), farmers agreed that they undertake savings and maintain cash reserves. A risk management action with the average scores below 3 indicates that they were generally not perceived as important. Other than maintaining reserves, generating off-farm source of income, taking insurance and on-farm enterprise diversification were also applied by them to manage the risk (Mean values between 3 to 4).

As taking insurance was given a considerable weightage by the farmers, their awareness towards two main types of rural insurance i.e. crop and cattle insurance was checked and compared with

Wilcoxon signed rank test.

**H<sub>0</sub> 1:** There is no significant difference in familiarity of the farmers for Crop and Cattle insurance.

**H<sub>1</sub> 1:** Familiarity of the farmers differs significantly for crop and cattle insurance.

**Table 4 Ranks of Farmers' Familiarity for Crop and Cattle Insurance**  
(As per *Wilcoxon Signed Rank Test*)

Particulars	Ranks	N	Mean Rank	Sum of Ranks
Familiarity with Crop- Cattle Insurance	Negative Ranks (Crop Insurance<Cattle Insurance)	33	23.64	780
	Positive Ranks (Crop Insurance>Cattle Insurance)	9	13.67	123
	Ties (Crop Insurance=Cattle Insurance)	13		
	Total	55		

(Source: Authors' Compilation)

**Table 5 Test Statistics of Farmers' Familiarity for Crop and Cattle Insurance**  
(As per *Wilcoxon Signed Rank Test*)

Particulars	Familiarity with Crop and Cattle Insurance
Z	-4.16
Asymp. Sig. (2-tailed)	.000

(Source: Authors' Compilation)

As per table 5, the 2-tailed significance value was found to be less than 0.05 i.e.  $p < 0.05$ . Hence,  $H_0$  is rejected. Higher mean ranks for the negative differences indicated that the farmers knew more about cattle insurance than crop insurance. The actual mean values for the awareness of the farmers for crop and cattle insurance were observed to be 3.44 and 2.44 on a scale of 1 to 5.

As the farmers knew very little about the crop insurance, they were further asked to rate the utility of various education efforts in spreading the awareness of crop insurance in Anand district.

As per table 6, the mean values for all the educational factors were found to be between 3 to 4 except the radio programme. Therefore, it may be interpreted that farmers believed that the above listed educational efforts may be very useful in spreading awareness of crop insurance in Anand district. The application of National Agricultural Insurance Scheme, kisan sabha and TV programmes were considered more useful to the farmers as compared to other factors such as village melas, sharing of experience by others insured, advisory service by experts, workshops/training by insurance company, printed materials, film show in village and road shows.

Further, only two respondents out of 55 have availed crop insurance from United India Insurance Company and their average annual premium was found to be ₹25000. They had taken insurance for the reason of security (40%), influence by friends (40%) and experts (20%). Out of these two respondents only one had asked for the settlement of claim which took four months. And their overall experience with the insurance company was found to be quite satisfactory.



Since, significant number of farmers had not availed crop insurance in the surveyed villages of Anand district (96%), the reasons for not availing such insurance was analysed with the help of weighted average mean. The results are displayed in the following table.

**Table 6 Descriptive Statistics of Farmers' Perception towards Educational Efforts for Spreading Awareness of Crop Insurance**

<b>Educational Efforts</b>	<b>Mean</b>	<b>Standard Deviation</b>
Kisan Sabha	4.02	0.85
Workshops/Training by Insurance company	3.44	0.94
Sharing of experience by others insured	3.82	1.06
Advisory service by experts	3.46	1.03
TV programs	4.02	0.87
Printed materials	3.38	1.06
Radio Programs	2.82	1.28
Village Melas	3.98	0.93
Film Show in village	3.31	0.90
Road Shows	3.09	0.94
National Agricultural Insurance Scheme	4.22	0.90

*(Source: Authors' Compilation)*

**Table 7: Weighted Average Mean of Reasons for not Availing Crop Insurance**

<b>Reasons for not Availing Crop Insurance</b>	<b>Weighted Average Mean</b>	<b>Rank</b>
Non-institutional source of loan	8.71	1.0
Lack of co-operation from the bank	8.25	2.5
Fear to understand and undertake the procedure involved	8.25	2.5
Complex documentation	8.14	4.5
Lack of premium paying capacity	8.14	4.5
Have not felt need	6.43	6.0
Not aware of the facilities available	5.25	7.0

*(Source: Authors' Compilation)*

As per table 7, the ranking of weighted average mean suggest that farmers gave more importance to the factors such as non-institutional source of loan, fear to understand the product, lack of co-operation from bank, complex documentation, lack of premium paying capacity as compared to the remaining reasons such as not felt need of having such insurance and not aware of the facility. From the previous discussion, it was understood that farmers were not much familiar with crop insurance. However, this factor is not given much importance by the respondents for not buying this insurance. Actually, their mindset is not developed in this direction and banks can play a very crucial role here by extending a full fledged support for making crop insurance as credit linked product.

The multiple response analysis of the actions taken by the farmers who were not insured, in case of yield loss, suggested that they borrow from friends and family (34%), take a bank loan (28%), sale their livestock (14%), borrow from money lender (11%), seek government relief (10%) and sale the gold (3%) in this order. Borrowing money to square the loss is risky affair. Selling assets is like parting with the accumulated wealth which is equally dangerous. Thus, it could be inferred that crop insurance will assist farmers to minimize the risk.

## Conclusion

Weather conditions are beyond the control of farmers and as such crop insurance is a catalytic tool to manage the production risk of crop. The study addressing the penetration of crop insurance in Anand district highlighted the fact that this product is not very familiar in respondents surveyed. Only two out of 55 farmers covered under the study, were having crop insurance. The composition of the sample reflected that all the farmers were male, having an average age of 49 years. The literacy level was found to be quite less. Apart from farming they were also involved in other activity such as cattle rearing and trading of goods.

The average frequency of crop failure was observed to be 1 to 2 times in a year due to climatic condition, economic reasons and quality of raw material. For protecting themselves against any loss including the failure of crop, they preferred having cash reserves and savings as compared to taking insurance. Further, they knew more about cattle insurance than crop insurance as far as agricultural insurance is concerned. As per them, NAIS, Kisan Sabha, and TV Programmes would be more effective in spreading the awareness of crop insurance. Apart from less awareness, the other reasons as surfaced for not availing crop insurance were: this insurance being non institutional source of loan, lack of co-operation from banks and fear on their part to undertake the procedure involved.

The fact that merely 4% of the sample were having crop insurance, represent a huge opportunity (96%) for penetration of crop insurance at Anand district. For this product to be successful, farmers should be convinced that taking this insurance is in their own interest. The actual penetration of crop insurance would depend on how and to what extent the farmers perceive it as beneficial to them. Farmers should believe that the terms of the insurance are reasonable, and have the confidence that there would be timely settlement of claims. Communication with farmers may be undertaken through kisan sabha, mass media, education programs and group interactions as reflected in data analysis.

A linkage and close working relationship with banking sector is significant for better penetration of crop insurance. Marketing of this insurance would be facilitated if it is linked to credit. Further, the administrative work can be integrated with the lending operation of banks which would help in keeping the expenses low. The banks can play a crucial role here by convincing the loanee farmers to avail insurance while taking loans for their crop. It is in the interest of the banks as they would be direct beneficiaries of crop insurance. This is because in case of claim, payment would be directly credited to farmer's loan account or bank account. Other than banks institutes with agriculture linkages such as suppliers of fertilizer, pesticide, seeds and farm equipment; trade associations, processors of the produce, marketing organizations, various government departments, agricultural universities and research institutions; can also be involved in marketing crop insurance scheme.

There is a need for continuous interaction between all the stake holders involved in implementation of NAIS to make it more successful i.e. banks, farmers and government agency.

As there is fear on the part of farmers regarding the complexity of this product, crop insurance at village level should be simple in design with user friendly policies so that they can understand the utility of this product. Various Self-Help Groups (SHGs) operational at grass root level can also be taken in a loop to spread awareness and ensure better penetration of crop insurance. E-Choupal, the initiative by ITC can also be tapped to increase the participation of farmers in the rural areas.

There is an urgent need to develop the mindset of the farmers in rural areas so as to understand that the premium payment is not a liability but an investment for them in the event of loss of crop.

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