



CROP INSURANCE: AN ADAPTATION TO DERISK INDIAN AGRICULTURE

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ABSTRACT

This paper explains the dependence of Indian agriculture on uncertain rains and climate changes. It then argues on the need for crop insurance as an alternate to manage production risk. It then takes up the historical overview of crop insurance schemes and their performance. The author also offers an image of crop insurance within the India. Crop insurance is still in its initial stage in India, to study impact of crop insurance on farmers is of prime importance. The issues and advantages of crop insurance are mentioned within the paper. Traditional farmers are increasing their operation to embody new and completely different choices in order to meet with new liability; problems and new risk management desires. Agriculture Insurance is a risk management tool used as a risk transfer device that farmers can depends on as an instrument of indemnity within the event of failure. It is followed by the discussion on the current government policies and schemes.

KEY WORDS: Insurance, risk, crop, premium, agriculture

INTRODUCTION

India being an agrarian economy and more the 60% of the population being involved in agriculture and allied activities, agriculture contributes 24% of the GDP and any change has a multiplier effect on the economy as a whole. Economic growth and agricultural growth are inextricably linked to each other. The Indian business cycle is influenced by the crop pattern that mainly depends on the vagaries of nature; every flood or drought has its own impact on the Indian economy. Agri-business includes lot of activities of agriculture sector under one umbrella, like integration of production, processing and marketing. The process starts at the product level and reaches out to the final consumers through vertical integration. Indian agriculture is largely dependent on rainfall which largely occurs during monsoon season of about two and half months. The Abnormal behaviour of monsoon may cause natural disasters such as scarcity conditions or drought, floods, cyclones, etc. **Mukesh H.V (2015)** stated that nearly 65% of the cropped acreage is vulnerable to drought in different degrees.

Climate change is a global environmental challenge that is threatening sustainable development around the world. It is a continuing long-term process manifesting itself with gradual increase in temperature, greater variability in rainfall, rise in sea level and increased frequency, intensity and duration of weather events, such as cyclone, drought, flood (**IPCC, 2007**). However, the impact of climate change is not uniform across all sectors or all regions of the world Agriculture dependent economies are invariably the low-income countries and are thus most vulnerable to climate change due to their high exposure with least adaptive capacity. Their high levels of susceptibility and low coping capacity have been linked to a range of factors that include a high reliance on natural resources, low per capita GDP and high poverty, limited ability to adapt financially and institutionally, and a lack of safety nets (**David and Twyman, 2005**). India being located in the low latitude region of South Asia is extremely prone to climate change because of its monsoon rain, tropical climate, long coast line, greater dependence on agriculture, high incidence of poverty, low irrigation coverage and inadequate resources and technology to combat climate change. Agriculture is the dominant sector in Indian economy. Agriculture contributes 22 percent of GDP, provides 58 percent of employment, sustains 69 percent of population, produces all the food and nutritional requirements of the nation, important raw materials for some major industries, and accounts for about 14 percent of exports. However, agricultural production is beset with various risk factors due to occurrence of natural calamities like flood, drought, cyclone and storm surge, infestation of plant diseases and pest attack, technology failure, irregularity in input supply etc.

Risk in agriculture can be considered as an interaction of production risk and price risk. Indian agriculture is now confronting two major threats: economic globalization and climate change (**O'Brien et al, 2004**). While climate change is accentuating the 4 production risk, globalization has raised the price fluctuations. The combined effect of these two stressors has created a crisis situation in Indian agriculture; as a result farmers' suicides are reported in most of the states indicating the failure of public action in handling the aggravated risk situation. However, of all the risk factors in agriculture, weather variables are considered to be the most important (**Miranda and Vedenov, 2001**). Government takes many steps such as drought proofing, flood proofing, extension of irrigation facility, watershed management, technology development, provision of insurance, relief measures etc. to reduce production risk. At the same time farmers take a various variety of adaptive measures before the event of crop loss and ex-post measures after the crop loss to cope with the production risk associated with climatic aberrations. The ex-ante measures mostly aim at smoothing income, whereas the ex-post measures are mostly consumption smoothing (**Murdoch, 1995**). The income smoothing measures include intercropping, mixed farming, changes in cropping pattern and sowing drought/flood resistant seeds, increasing irrigation efficiency and income diversification. The ex-post management usually adopted by the farmers after the occurrence of the crop loss is drawing down of savings, borrowing, sale of assets and migration (**Magmata Swain 2014**)

CROP INSURANCE

Insurance is a mechanism in which payment of a certain small amount of premium ensures the receipt of a larger amount of compensation contingent upon the occurrence of an uncertain loss event. **Crop Insurance is an effective tool to share the risk of agriculture.** Crop insurance is a coping mechanism and ex-ante adaptation measure by which risk is transferred from the insured to the insurer. Losses incurred in bad years are compensated from resources accumulated in good years. Most of the Indian farmers are having small size of land holding and resource-poor. Therefore, they are usually risk averse and in the face of production risk and absence of insurance, they manage their farms so as to minimize loss rather than maximizing profit. Whereas specialization may lead to efficiency in resource use due to economies of scale, The Indian farmers diversify the cropping pattern and occupation to spread risk. This results in inefficient allocation of resources and sub-optimal output.

CROP INSURANCE IN INDIA

Indian agriculture is largely dependent on rainfall which occurs during Monsoon season of about two and half months. The abnormal behaviour of monsoon may cause natural disasters such as scarcity conditions or drought, floods, cyclones, etc. Nearly Two thirds of the cropped acreage is vulnerable

to drought in different degrees. On an average 120 lakhs hectares of crop area is affected yearly by these calamities impacting the yields and total agricultural production.

About two thirds of the cultivated area has no irrigation. Even large part of irrigated Area does not get adequate water supply for intensive cropping (double cropping). In rained Areas sowing of khaki crops commences with the onset of monsoons and the delay in the Onset of monsoons delays sowing with its adverse impact on yield. Further the growth of Crops and realization of output are determined by the quantum of rainfall and its distribution during the monsoon season. Even sowing of rabbi crops is determined by the soil moisture retained from the rains especially during the latter part of the monsoon season. Rainfall pattern affects the irrigated crops also. Rainfall during flowering period washes the pollens adversely affecting the crop yield. Excess rainfall may adversely affect the yield realization. Heavy rains may submerge the growing crops in the early stages and may cause lodging in the later stages of crop growth (**Gurdev Singh, June 2010 W.P. No. 2010-06-01**)

CROP INSURANCE PRINCIPLES

The principle underlying insurance of crop is that loss incurred by a few is shared by many in an area. **Dandekar (1976)** explained losses incurred in bad years are compensated from resources accumulated in good years.

IN GENERAL, THE PRINCIPLE OF CROP INSURANCE MAY BE OUTLINED AS FOLLOWS

- (1)** Risk faced by individual farmers is transferred to the insurer by their participation in large numbers, for which benefit, the insured farmers pay a risk premium.
- (2)** Total loss is divided between farmers over a wide area, i.e., horizontal spreading of risks over a wide and vertical spreading over many years.
- (3)** The risk premium reflects the group risk assumed by the insurer; an indemnity is liable to be paid to the individual farmer when a loss is incurred due to causes beyond the control, as long as they maintains the insurance contract valid by paying the premium without default.

RISK AND UNCERTAINTY IN AGRICULTURE

Uncertainty refers to an event the outcome of which is not certain i.e. the outcome may be one of the many possible outcomes. As such it cannot be measured. But certain probability may be attached to individual outcome. Risk on the other hand refers to the impact of the unknown result on the quantity or value of some economic variable. The value of the economic variable may be on either side of the mean value. Repeated events would result different outcomes having a range of values. Thus risk refers to the variations in value of an economic variable resulting from the influence of an uncertain event. Agricultural production is an outcome of biological activity which is highly

sensitive to changes in weather. Important weather factors such as humidity, temperature rainfall, wind etc. influence the biological process directly or indirectly.

NEED FOR CROP INSURANCE

Crop insurance is one alternative to manage risk in yield loss by the farmers. It is the mechanism to reduce the impact of income loss on the farmer (family and farming). Crop insurance is a mean to protect farmers against the variations in output resulting from uncertainty of practically all natural factors beyond their control such as flood, hails, rainfall (drought or excess rainfall), other weather variables (wind, sunlight, sunlight, wind), pest infestation, etc.

Crop insurance is a mechanism to reduce the impact of loss in farm income by factoring in a large number of uncertainties which affect the crop yields. It is a risk management option where production risks are transferred to another party at a cost called premium. The weather based crop insurance uses weather variables as proxy for crop yield in compensating the cultivators for deemed crop losses. It provides a good alternative both to farmers and government. Farmers get on actuarially. Fair insurance with swift payments at little administrative costs to the government. Rainfall insurance is a specific form of weather insurance. As such weather insurance is not. Yield insurance while crop insurance is. In both the cases cultivators pass risk in yield to another party for a premium. The insurance need for agriculture, therefore, cannot be over emphasized as it is highly risky economic activity because of its dependence on weather conditions. Designing and implementation appropriate insurance programme for agriculture is therefore very complex.

THREE MODELS OF CROP INSURANCE_(Vladimir Čolović, Napata Marvin Petrolia, 2014)

It is very difficult to define models of crop insurance. In order that this insurance type be developed in one country, it is necessary to fulfil certain conditions not only for insurance development in this country, but also the conditions relating to the government strategy in terms of agricultural policy and government investments in agricultural development. Nevertheless, we can define three basic market models through which insurance in agriculture can be accomplished:

- 1. Complete market system:** have low to moderate penetration and low level of risk diversification, , commercial criteria dominate over technical, with the realization of competitive prices and without fiscal expenses (**Manić, 2012**). Practically, all in this model depends on the interests by insurer for dealing with this kind of insurance and this interest, also, depends on definition of agricultural policy in one country.
- 2. Systems fully controlled by the government:** they are characteristic for very intensive support by the government with the existence of one unified insurance product that is usually commercialized through a state-owned insurance company with a monopolistic position. Those

systems are characteristic, expectedly, with a large market penetration due to the obligation and good portfolio diversification, but they means high fiscal expenses, frequent bad service caused by monopolistic position. In this model, the role of the state is the key, i.e., that of the insured where the state has full control.

3. **Public – private partnerships:** have high penetration and a good diversified portfolio, technical criteria dominate over commercial, there is competition in the provision of services, and the state reinforces system stability. Also, the private sector provides the knowledge and technology, all with reasonable fiscal benefits

SCHEMES RELATED TO CROP INSURANCE

Table 1: Major Crop Insurance Plan in India_(Ram parkas, Atari Sharma September 2014)

Name of the plan	Duration plan	Sum assured	Premium for plan	Subsidy for plan
First individual approach scheme	1972-1978	N.A	N.A	N.A
Pilot insurance scheme	1979-1984	100-150 percent of crop loan	5-10% of sum assured	50% shared equally between the central and state governments
Comprehensive crop insurance scheme	1985-1999	Institution ,loan 100%9maximum of rs 10000 per farmer)	2% of cereals and millets	50% subsidized equally by the central and state government
NAIS	1999	Equal to 150 of distinct average yield on minimum support price	1.5-3.5% of sum assured of food crop	50% subsidized equally by the central and state government
Pilot scheme on seed crop insurance	1999-2001	3\5 percent of year index value of seed on last season procurement price by national	3-5% on crop variety	N.A

		seed corporation		
Weather index insurance	2007	Sum of rs50000 , 25000 for weather insurance and remaining 25000 for yield insurance	Weather index cover is 12% and yield index cover is 10%	70-50% respectively

1. NATIONAL AGRICULTURAL INSURANCE SCHEME

Keeping in view the demands of States for improving scope and contents of CCIS, a broad-based National Agricultural Insurance Scheme (NAIS) has been introduced in the country from Rabi 1999-2000

1. OBJECTIVES

To provide insurance coverage and financial support to the farmers in the event of natural calamities, pests & diseases.

To encourage the farmers to adopt progressive farming practices high value in-puts and higher technology in Agriculture.

To help stabilize farm incomes, particularly in disaster years.

The Scheme would work on the basis of 'Area Approach' i.e., Defined Areas for each notified crop for widespread calamities and on an individual basis for localized calamities such as hailstorm, landslide, cyclone and flood.

2. RISKS COVERED & EXCLUSIONS

Comprehensive risk insurance will be provided to cover yield losses due to non-preventable risks, viz.:

- i) Natural Fire and Lightning
- ii) Storm, Hailstorm, Cyclone, Typhoon, Tempest, Hurricane, Tornado etc.
- iii) Flood, Inundation and Landslide
- iv) Drought, Dry spells
- v) Pests/Diseases etc.

Three levels of Indemnity, viz., 90%, 80% & 60% are corresponding to Low Risk. Medium Risk & High Risk areas shall be available for all crops (cereals, millets, pulses & oilseeds and annual commercial/ annual horticultural crops) based on Coefficient of Variation (C.V.) in yield of past 10 years' data. The

insured farmers of unit area may opt for higher level of indemnity on payment of additional premium based on actuarial rates

'Indemnity' shall be calculated as per the following formula:

Shortfall in Yield

----- x Sum Insured for the farmer

Threshold yield

{Shortfall = "Threshold Yield – Actual Yield' for the Defined Area}

3. PREMIUM SUBSIDY

Fifty percent subsidy in premium is given in respect of Small & Marginal farmers to be shared equally by the Govt. of India and State/UT Govt. The premium subsidy will be phased out on sunset basis in a period of three to five years subject to review of financial results and the response of farmers at the end of the first year of the implementation of the Scheme.

The definition of Small and Marginal farmer would be as follows:

Small Farmer: A Cultivator with a land holding of 2 hectares (5 acres) or less, as defined in the land ceiling legislation of the concerned State/UT.

Marginal Farmer: A Cultivator with a land holding of 1 hectare or less (2.5 acres).

4. SHARING OF RISK

Risk will be shared by IA and the Govt. in the following proportion.

Food crops & Oilseeds: Till, complete transition to Actuarial regime in a period of five years takes place, claims beyond 100% of premium will be borne by the Govt. Therefore, all normal claims, i.e. claims up to one hundred fifty percent of premium will be met by IA and claims beyond 150% shall be paid out of Corpus Fund for a period of three years. After this period of three years claims up to 200% will be met by IA and above this ceiling out of the Corpus Fund.

5. PROCESS FOR APPROVAL AND SETTLEMENT OF CLAIMS

Once the yield data is received from the State/UT Govt. as per the prescribed cut-off dates, claims will be worked out and settled by IA.

The claim cheques along with claim particulars will be released to the individual Nodal Banks. The Bank at the grass root level, in turn, shall credit the accounts of the individual farmers and display the particulars of beneficiaries on their notice board.

In the context of localized phenomenon, viz., hailstorm, landslide, cyclone and flood, the IA shall evolve a procedure to estimate such losses at individual farmer level in consultation with DAC/State/UT. Settlement of claims will be on individual basis between IA and insured.

6. FINANCIAL SUPPORT TOWARDS OPERATING & ADMINISTRATIVE (O & A) EXPENSES

The A & O expenses would be shared equally by the Central Govt. & respective State Government on sunset basis [100% in 1st year, 80% in 2nd year, 60% in 3rd year, 40% in 4th year, 20% in 5th year and 'zero' thereafter.

7. CORPUS FUND

To meet catastrophic losses, a Corpus Fund shall be created with contributions from the Govt. of India and State/UT on 50:50 basis. A portion of Calamity Relief Fund (CRF) shall be used for contribution to the Corpus Fund.

The Corpus Fund shall be managed by Implementing Agency (IA).

8. REINSURANCE COVERS

Efforts will be made by IA to obtain appropriate reinsurance cover for the proposed RKBY in the international Reinsurance market.

9. MANAGEMENT OF THE SCHEME, MONITORING AND REVIEW

In respect of Loaned farmers, the Bank shall collect the premium along with the Declarations and send it to IA within the prescribed time limits. However, in areas where IA has requisite infrastructure, a non-loaned farmer will have option to send premium along with Declaration, directly to IA within the time limits.

Selection of the Banks will be on the basis of Service Area Approach (SAA) of RBI or at the option of the Banks (Where co-operative banks have good network). The Department of Agriculture, Agricultural Statistics, Directorate of Economics and Statistics, Department of Co-operation, Revenue Department of the State Government will be actively involved in smooth implementation of the Scheme.

10. IMPLEMENTING AGENCY (IA):

An exclusive Organization would be set up in due course, for implementation of RKBY. Until such time as the new setup is created, the 'GIC of India' will continue to function as the Implementing Agency. **(Guryev Singh June 2010)**

2. WEATHER BASED CROP INSURANCE SCHEME (WBCIS)

Weather Based Crop Insurance Scheme is weather based insurance product build to provide insurance protection against losses in crop output resulting from adverse weather incidences. It provides payout against adverse rainfall incidence (both excess and deficit) during Kharif and adverse incidence in weather parameters like frost, heat, relative humidity, un-seasonal rains etc. during rabbi season. WBCIS has been piloted in India since Kharif 2003 season. Some of the states

where the scheme is piloted over the years are Andhra Pradesh, Bihar, Chattisgarh, Gujarat, Haryana, and Karnataka.

ADVANTAGES OF WBCIS

WBCIS has many benefits which make it beneficial for cultivators in their production risk management such as the following.

1. Trigger events like adverse weather can be independently verified and measured.
2. It allows speedy settlement of claims
3. All farmers can buy WBCIS
4. Government provides subsidy in premium and hence premium payable is affordable It provides transparent, fully objective, efficient and direct payouts for adverse weather incidences
5. Insured is not required to submit claim form or other documents as proof for loss since the weather data decides the compensation the insured is willing to put extra effort for getting better yield of crop.

GOVERNMENT CURRENT SCHEME

The Pradhan Mantri Fasal Beema Yojna is aimed to be a major policy towards farmers. The most crucial element of the scheme is that it will bring down the rate of premium to be paid by farmers to a maximum of 2% of the sum insured. The rest will be paid by the state and the central government. Currently, farmers have to pay a premium ranging from 4 to 15 per cent to insure crops.

The scheme will create a security for farmers and will provide financial relief. Crop insurance schemes have been around since 2008, but they have registered a mere 23% cover. The aim is to increase it to 50% cover in the next few years. "Farmers didn't accept the scheme because of deficiencies. The government has now removed those. The scheme entails immediate payment of 25% of the due compensation; the money will go directly to bank accounts of the farmers.

Under the scheme, farmers will have to pay a premium of two per cent uniformly for all kharif crops and 1.5 per cent for all rabi crops. For annual commercial and horticultural crops, farmers will have to pay a premium of 5 per cent. The remaining share of the premium will continue to be borne equally by the Centre and the respective state governments.

With farmers having been required to pay a premium share of as high as 15 per cent in several areas in the country, there has been a long-standing discussion on the need to bring down these rates. The Centre's move to bring down and cap these interest rates is being viewed as a major government policy outreach towards the farmers.

NEGATIVE ASPECT OF CROP INSURANCE

- In initial vision of insurer for crop insurance is somewhere lost its importance between the farmers due to its mechanism. First two plans of crop insurance focuses only the loaned farmer for the repayment of loan insists of farmer crop.
- Crop insurance plans are not attracting farmer due to lower feasibility with their need of financial assistance on time. Some of its crucial aspects like payment on time, actuarial practice and control mechanism push towards back front. Designing and delivery mechanism of insurance plan is not effective to convince farmer with its message and importance to them as an effective tool of hedging
- The crop insurance scheme suffer from several problems which are endemic to the nature of the product premium of plan
- These include problems of timely and reliable yield measurement, actuaries of claim payment, exclusive reliance on rural financial institution to deliver the product
- Given these problem the private sector is unlikely to offer yield insurance even in partnership with government
- Crop insurance is facing tribulation of poor interest of farmer as well as adverse selection and section by bankers to to achieve targets. **(Parkash Ram, Sharma Arti, 2014)**

CONCLUSION

Traditional farmers are expanding their operation to include new and different options in doing so they are met with new liability; issues and new risk management needs. Agriculture Insurance is a risk management tool and as a risk transfer device that farmers can depends on as an instrument of indemnity in the event of crop failure. Risks like the price for the agriculture produce and Monsoon are two major factors on which the agriculturalist has absolutely no control. In a country like India, where crop production has been subjected to vagaries of weather and large scale damage due to attack of pests and diseases, agriculture insurance assumes a vital role in the stable growth of the agriculture sector.

Agriculture Insurance requires the full support of the **IRDA**. The present Agriculture insurance policies are weak on the various fronts. Crop insurance has been found to absorb the production risk effectively, encouraging the farmers to concentrate on a fewer number of profitable crops instead of spreading their resources and energy across many crops.

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