

Weather based **Crop Insurance**

All around the world agriculture is one of the biggest sectors to be impacted by Climate Change. Agriculture provides food and is the backbone of Indian economy. India suffers from drought in one region and floods in another at the same time. The erratic pattern of rainfall destroys the harvest many a times and the farmers have to struggle to make ends meet. Climate Change will make the situation even more uncertain and thus the farmers require insurance on crops to reap benefits on their investments. Insurance is a tool for farmers to circumvent the risk that they face due to Climate Change. This fact sheet informs the readers about weather based crop insurance schemes in India.

Climate Change

Life on earth is possible because of the warmth of the sun. While some of this incoming solar radiation bounces back into space, a small portion of it is trapped by the delicate balance of gases that make up our atmosphere. Carbon dioxide (CO₂) is the most important gas in this layer of insulation. Carbon is stored all over the planet in plants, soil, the ocean, and even in human beings. We release it into the atmosphere as carbon dioxide through activities such as burning fossil fuels (coal, oil and gas) and cutting down trees. As a result, today's atmosphere contains 32 per cent more carbon dioxide than it did at the start of the industrial era.¹

Humankind has released so much of carbon dioxide in the atmosphere that it traps more heat now leading to global warming. This disrupts the atmospheric balance and impacts in many known and unknown ways. The result: Climate Change.

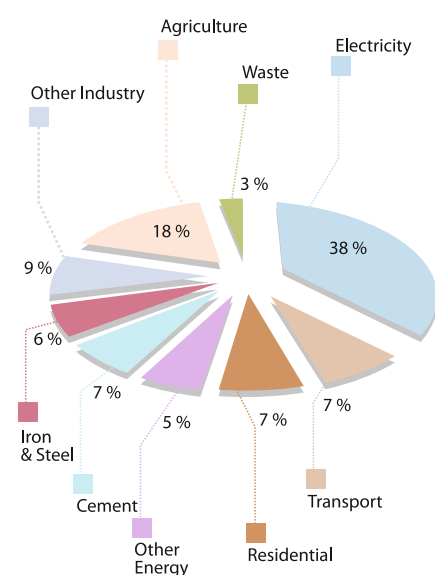


Figure 1 :
GHG emissions of India 2007

Source: INCCA. India: Greenhouse Gas Emissions 2007. New Delhi : MoE, GOI, 2010

Agriculture and Climate Change

The agriculture sector represents 35% of India's Gross National Product (GNP) and plays a crucial role in the country's economic development. Food grain production quadrupled during the post-independence era; this growth is projected to continue². Climate Change projections made up to 2100 for India, indicate an overall increase in temperature by 2-4°C coupled with increase in precipitation, especially during the monsoon period.

IPCC reports and other studies indicate a probability of 10-40% loss in crop production with increase in temperature by 2080-2100.

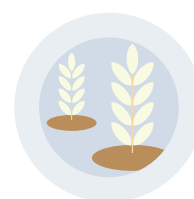
Mall et al. (2006) provide an excellent review of Climate Change impact studies on Indian agriculture mainly from physical impacts perspective. The available evidence shows significant drop in yields of important cereal crops like rice and wheat under Climate Change conditions.

Insurance is the tool for agriculturists to hedge against the risk of crop and yield losses.

Given below is the information of weather based crop insurance scheme started by Agriculture Insurance Company of India Ltd. (AIC)³

Weather based Crop Insurance (WBCI)

Weather based Crop Insurance aims to mitigate the adversity faced by the insured farmers against the likelihood of financial loss on account of anticipated crop loss resulting from incidence of unfavorable conditions of weather parameters such as rainfall, temperature, frost, humidity etc. WBCI Scheme was implemented by AIC in 14 States in Kharif 2011 and 13 States in Rabi 2011-12, covering, in all, more than 35 different crops, including perennial crops like apple, citrus crops, grapes, mango, pomegranate, cashew nut and palm oil.



Shifting optimal crop growing zones

Changing patterns of precipitation (quantity and variability)

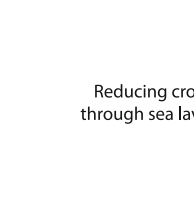


Shifting the habitat of crop pests and diseases

Affecting crop yields through the effects of carbon dioxide and temperature



Reducing winter storage of moisture in snow and glacier areas



Reducing crop land through sea level rise

Figure 2 :
Climate Change impacts on agriculture

¹ Suzuki, D. <http://www.davidsuzuki.org>. 2012. <http://www.davidsuzuki.org/issues/climate-change/science/climate-change-basics/climate-change-101-1/> (accessed September 4, 2012).

² DEFRA, MoEF. "Climate Change Impacts on Agriculture in India." 2005

³ AIC. "Frequently asked questions." <http://www.aicofindia.com>. 2012. http://www.aicofindia.com/AICEng/General_Documents/Product_Profiles/WBCIS_FAQ.pdf (accessed September 5, 2012).



Difference between Crop Insurance and Weather Based Crop Insurance

Weather Based Crop Insurance, is based on the fact that weather conditions affect crop production even when a cultivator has taken care to ensure good harvest.

Historical correlation studies of crop yield with weather parameters help us in developing weather thresholds (triggers) beyond which crop starts getting adversely affected. Payout structures⁴ are developed to compensate cultivators to the extent of losses deemed to have been suffered by them using the weather triggers.

Presence of the Insurance scheme in Indian States

Weather Insurance has been started in the country since Kharif 2003 season. Some of the States where it is piloted are Andhra Pradesh, Chhattisgarh, Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Punjab, Rajasthan etc.

Operation of the scheme

WBCI Scheme operates on the concept of "Area Approach" i.e., for the purposes of compensation, a 'Reference Unit Area (RUA)' is deemed to be a homogeneous unit of Insurance. This RUA is notified before the commencement of the season by the State Government and all the insured cultivators of a particular insured crop in that Area will be deemed to be at par with the assessment of claims. Each

RUA is linked to a Reference Weather Station (RWS), on the basis of which current weather data and the claims would be processed. Adverse Weather Incidences, if any during the current season would entitle the insured a payout, subject to the weather triggers defined in the 'Payout Structure' and the terms & conditions of the Scheme. The "Area Approach" is as opposed to "Individual Approach", where claim assessment is made for every individual insured farmer who has suffered a loss.

Mumbai Metropolitan Region

Agriculture in Mumbai Metropolitan region is under threat due to urbanization and industrialization. Climate Change will have additional stress on the cropping patterns and produce. Parts of Maharashtra are already under the crop insurance schemes. There is a great requirement for protection of farmer needs due to rising water woes. The insurance schemes will help the most vulnerable farmers with small and medium land holding if proper awareness is generated among them.

Beneficiaries

All Cultivators (including sharecroppers and tenant cultivators) growing the crop (insurable under the scheme) in any RUA in the Pilot areas are eligible for coverage. However, the Scheme is mandatory for all Loanee Cultivators of Lending Banks / Financial Institutions who have Sanctioned Credit Limit for the particular crops and optional for others.

Amount of insurance protection

Amount of insurance protection (sum insured) is broadly the cost of inputs expected to be incurred by the insured in raising the crop. Sum insured is pre-declared per unit area (Hectare) by Agriculture Insurance Company (AIC) at the beginning of every crop season, in consultation with experts in State Government; and it may be different for different crops in different RUAs. Sum insured is further distributed under the key weather parameters used in the insurance in proportion to the relative importance of the weather parameters.

Other weather based schemes have also been started by the private insurance companies like :

1) ICICI Lombard

a. Deal initiated : Oranges in Jhalawar, Rajasthan

b. Groundnut, castor and cotton crops in Andhra Pradesh

2) HDFC ERGO

a. Paddy in West Bengal

b. Soya bean in Madhya Pradesh

c. Oranges, guava, sweet lime in Maharashtra

The policy structure for AIC, HDFC ERGO and ICICI Lombard is different from each other. In addition, the AIC WBCIS description given does not represent the original policy document.

⁴ The expected financial return from an investment over a given period of time. Payout may be expressed on an overall or periodic basis as either a percentage of the investment's cost or in a real dollar amount. Payout can also refer to the period of time in which an investment or a project is

expected to recoup its initial capital investment and become minimally profitable. Read more: <http://www.investopedia.com/terms/p/payout.asp#ixzz2EAvg9NZI>



A research paper by The World bank on WBCIS⁵ concluded that :

1. A comparative statistical analysis of different products would be valuable and should be possible in India given the availability of long-term yield and weather data. This could lead to further standardization of products, based on agronomic and statistical principles, which would in turn support robust actuarial design and pricing. In addition to this analysis, the current market structure, under which insurers propose both products and prices, may not offer appropriate incentives to insurers to invest in developing improved products since innovations can be copied by rival insurers.

2. Governments may wish to enhance consumer protection legislation for indexed insurance products, for example, by requiring that any contract states historic burn costs for at least the last ten years. This could help farmers decide whether a particular product is good value, and whether it could be relied on to pay out in bad years.

3. WBCIS offers substantial opportunities to understand how to increase demand, particularly from the most vulnerable farmers. A rigorous monitoring and evaluation could be integrated into these programs to ensure that at the end of the pilot period government and states have the information they need to make decisions about the future of agricultural insurance in India.

The rural non-farm economy that is seen as a great prospect for livelihood creation is closely linked with agriculture. A large share of rural manufacturing involves production and supply of farm inputs and agro-processing. Rural services target farmer's needs. Any reduction in farm production will directly impact the rural non-farm sector. Any decrease in farm productivity would lead to decreased demand in the otherwise burgeoning Indian manufacturing and service sector. The insurance should cover these aspects. In addition, the small and medium farmers who do not understand the complexity of insurance refrain from opting of it.



For further information, Refer to :

1. AIC. "Frequently asked questions." <http://www.aicofindia.com>"
2. INCCA. India: Greenhouse Gas Emissions 2007
3. Clarke, Daniel J.; Mahul, Olivier; Rao, Kolli N.; Verma, Niraj. 2012. Weather based crop insurance in India. Policy Research working paper; no. WPS 5985. Washington D.C. - The World bank. Available at: <http://documents.worldbank.org/curated/en/2012/03/15891447/weather-based-crop-insurance-india-weather-based-crop-insurance-india>
4. Mall et al. (2006): *Impact of Climate Change on Indian Agriculture: A review* Available at: <http://link.springer.com/article/10.1007%2Fs10584-005-9042-x>

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⁵ Clarke, Daniel J.; Mahul, Olivier; Rao, Kolli N.; Verma, Niraj. 2012. Weather based crop insurance in India. Policy Research working paper; no. WPS 5985. Washington D.C.