IJMDRR
E- ISSN –2395-1885
ISSN -2395-1877

Research Paper

PERFORMANCE OF WEATHER BASED CROP INSURANCE SCHEME IN INDIA: A CRITICAL ANALYSIS

Dr. B. Nagaraja * Dr. M. Sriramulu**

**Associate Professor,Department of Economics,Sri Venkateswara University College of Arts ,Tirupati ,Chittoor District (Andhra Pradesh)India.*

***Lecturer in Commerce, Visvodaya Government Degree College,Venkatagiri, SPSR Nellore District, Andhra Pradesh, India.*

Abstract

Risk management in Agriculture is relatively a neglected area of research and needs proper attention. Agricultural Insurance is a method of risk management in agriculture and the cultivation of crops as well as farmers are prone to both production risks and market risks. The present paper deals with a critical analysis of Weather Based Crop Insurance Scheme in India, as cultivation of crops is mostly dependent on rainfall, temperature, and other natural factors, which are beyond the control of farmers and influence the production and productivity to the significant extent. Natural factors acts as important inputs into the agricultural production process and particularly the weather becomes a major cause of unplanned fluctuations in agricultural output and yield. Hence, an attempt is made in this paper to evaluate the performance of WBCIS in India with a particular focus on the market size of the scheme, analyzing the farmers' benefited ratio and claims settlement ratio. Specific analysis was also made to present the performance of the states in India measured by farmers' benefited ratio, claims settlement ratio, average area insured and the percentage of claims paid to gross premium collected under this scheme. This paper provides an overview of the performance of the scheme both in Kharif and Rabi seasons and concludes that proper attention is to be paid for improving the claims settlement ratio, particularly in the states like Uttar Pradesh and Bihar, where it is found very low. It is also suggested that publication of detailed information with regard to the protection received by the marginal and small farmers, who are resource-poor and prone to weather-influenced loss of farm income, is necessary to assess the performance of this scheme.

Key Words: Agricultural Insurance, Weather Based Crop Insurance Scheme, Claims Settlement Ratio, Farmers' Benefited Ratio, Area Insured.

INTRODUCTION

Generally it is commented that risk management in agriculture is an under addressed topic relative to other areas of importance in agricultural sector, in spite of its manifest importance. Researchers feel it difficult to get time-series data and observations at a farm or holding, sometimes is necessary to arrive at a conclusion, which demands the expertise and the commitment of the investigators in the collection of data. The necessary information to be collected, in most cases, is fragmented and indirect. Particularly in rural areas where the markets for land ,labour, irrigation water and credit are inter-locked, it becomes difficult to collect and interpret the data collected, though it is available. Importantly, agriculture is an intrinsically risky economic activity, upon which both exogenous and endogenous variables impact the farmers to the significant extent, resulting into production losses as well as market-losses. Though the Indian farmers are well acquainted with traditional risk management mechanisms and adaptation strategies like inter-cropping, changing varieties, crop diversification, diversifying income sources, they may not prove always efficient and effective against climatic shocks and disturbances. It is also observed that these uncontrolled natural shocks are further amplified in the areas where financial markets are imperfect and neglect the resource-poor weaker farmers, who are operating particularly in rain fed areas where assured irrigation facilities are absent. Hence, it is highly essential to have a strategy for farmers operating under a variety of risks and it is inevitable to stabilize the crop incomes to protect the livelihoods of the farmers in rural areas.

The experts analyzing the risks in agriculture and its management classify risk in agriculture, macro level, into two broad categories – Production risks and Market (Price) risks. They fundamentally argue that the "laws of large numbers" is to be applied to agricultural risks, where the losses suffered by farmers in particular 'risk-affected' areas are shared by farmers in unaffected areas could be used as a coping mechanism and for

indemnification of losses in risky years. Hence, the strategy of risk-pooling and insurance arrangements were thought as protective mechanisms against weather risks (Bharat Ramaswamy et. al. 2003) Particularly in dry lands, which do not have access to assured irrigation, weather, with its many attributes like rainfall, temperature and sunlight, acts as an important input into the production process, which farmers are unable to control. By this nature, weather becomes a major cause of unplanned fluctuations in agricultural output and yield. Again it is to be accepted that the effects of weather on crop yields are specific to the crop, soil type, region and other factors such as whether the land is irrigated or not. (Clarke. et.al 2011).

WEATHER INDEXED INSURANCE

Agriculture Insurance, as a mechanism of an institutional response to risk management in agriculture existed in many countries, even in the early years of 20th century. In 1930's Japan, Europe, the US and Canada introduced crop insurance, covering multiple risks in agriculture. Even before, in 1920, J.S. Chakravarti designed a scheme of agricultural insurance in India, based on rainfall. His approach was appreciated as an innovative application of the fundamental principle of insurance to the subject of risk management in agriculture. However, his approach did not receive attention it deserved. Area approach, a scheme of drought insurance, crop-credit insurance and individual approach to crop insurance, and area-yield crop insurance schemes were introduced in the agriculture insurance system during the succeeding years and particularly during the last decades of 20th century.

Keeping in view the incidence of weather risk in agriculture, a financial innovation in the form of "weather insurance" was introduced in 2003 as the index-based rainfall insurance. From Kharif-2007 season, a weather-based crop insurance scheme was piloted across India to explore the effectiveness of weather- based crop insurance as an alternative to the National Agricultural Insurance Scheme. The Weather Based Crop Insurance Scheme (WBCIS) operates on the principles of "area approach" in the selected notified reference unit areas. For this scheme, "Reference Unit Area" refers to "a unit area of insurance for the purpose of acceptance of risk and assessment of compensation as well". Hence, all insured cultivators of a notified crop in the notified reference unit area are deemed to be on par so far as their terms of coverage of insurance and assessment of compensation are concerned. All the cultivators, including share croppers and tenant cultivators growing any notified crop in any reference unit area, are eligible for coverage. It is to be remembered that the location of the weather station for claim settlement is considered as the most important factor for farmer-clients.

THE PRESENT PAPER

It was alleged that the agricultural insurance programmes, even around the globe, were unable to fully cover their own indemnity payments and administrative costs with the collected premiums and the no. of farmers covered is very low. The studies, which have investigated into the performance of WBCIS and the impact on the farmers, have thrown up a variety of perceptions, experiences and perspectives (Government of India, 2011). Insignificant compensation, location of the weather station, collection of crop loss data and its variation, time delay in claims settlement, types of risks covered and quantum of sum assured were identified as the important issues that hindered the efficiency and effectiveness of the WBCIS.

OBJECTIVES

Keeping the findings of the field-level surveys in view, an attempt is made in the present paper to present a critical analysis of WBCIS in India with the following objectives:

1. Examining the trends of the market for Weather Insurance Scheme
2. Estimating the Farmers'-benefited Ratio
3. Assessing the Claims Settlement Ratio
4. Analyzing the performance of WBCIS in the States of India, measured by Farmers-Benefited Ratio, Claims Settlement Ratio, Average Area Insured and Proportion of Claims paid to Gross Premium Collected.

Sources of Data

The present paper is exclusively based on secondary data for a period of 8 years i.e from Kaharif 2007-08 to Kahrif 2014-15, collected from the annual reports of IRDA, Agricultural Statistics at a Glance-2014, published

by the Government of India Surveys of National Sample Survey Organization (70th Round), ASSOCHAM-Skynet Survey report on Insurance and e-sources of evaluation reports published by World Bank, Government of India and the literature of research papers published in ASCI Journal of Management, NCAP working papers and working papers of Harvard Business School. Data has been collected keeping in view the objectives laid down for the present study and necessary calculations were made to arrive at meaningful conclusions.

DISCUSSION AND RESULTS

A. Market Size

WBCIS was the result of the combination of high vulnerability of farmer's households and low penetration of National Agricultural Insurance Scheme. In this scheme, weather index insurance was introduced where the claim payment to farmers is an explicit function of weather parameters such as rainfall, temperature, and humidity as recorded at a local weather station. This scheme being implemented by Agricultural Insurance Corporation and private insurance companies since 2007, has gained the appreciation as a scheme offering lower moral hazard and quicker claim settlement than yield-based schemes. The first weather insurance product in India was a rainfall insurance contract underwritten in 2003 by ICICI Lambard General Insurance Company for groundnut and castor farmers in Mahabubnagar district of Andhra Pradesh state. (World Bank,2012). As a result of this pilot, there was a high rate of growth in the number of farmers insured between 2003 and 2007. It was noted that the number of farmers in 2003-04 were only 1000, which went up to 6,78,425 by the year 2007-08, with a sum insured worth of US $ 398 million (World Bank, 2012). The market for weather indexed insurance in India was fundamentally changed in 2007 with the launch of this scheme and the National Agricultural Insurance Scheme was the only option available till then. In 2007-08, the states in India began to opt this WBCIS as an alternative to the National Agricultural Insurance Scheme. Thereafter, there was a tremendous increase in the no. of farmers insured as shown in Table. 1,

Table.1. Market Size of the Weather Based Crop Insurance Scheme in Kharif and Rabi Seasons
(All Companies combined)

Year	No. of Farmers (in Lakhs)	Area Insured (in Lakh Hectares)	Sum Insured (Rs. Lakhs)	Gross Premium (Rs. Lakhs)
2007-08	6.78	10.68	179191.24	14835.15
2008-09	3.75	4.82	88742.93	8169.13
2009-10	23.63	34.22	497369.27	44763.57
2010-11	93.02	131.37	1431546.47	12879.11
2011-12	116.74	157.33	2073016.48	185720.02
2012-13	136.21	181.66	2406457.28	223526.05
2013-14	140.89	166.42	2558461.21	240483.07
2014-15 (P)@	80.92	97.86	1305367.63	154474.04
All Years	601.94	784.36	105,40,152.51	10,00,950.15

Note: @ Kharif season only
Source: Government of India (2015) Agricultural Statistics at a Glance – 2014, p.352 and 353.

It is evident from the data presented in Table. 1 that the no. of farmers covered has increased to 1.41 crore in 2013-14, which was only 6.8 lakhs in 2007-08. From Kharif season 2007 to Kharif season 2015, totally more than 6 crore farmers were covered under this scheme. The area insured has significantly increased from 10.7 lakh hectares in 2007-08 to 1.7 crore hectares in 2013-14 with an insured sum of Rs.2558461.21 lakhs, which was only Rs. 179191.24 lakhs in 2007-08. There was a tremendous increase in the gross premium paid from Rs. 14835.15 in 2007-08 to Rs. 2, 40,483.07 lakhs in 2013-14.

B. Farmers Benefited Ratio

WBCIS was designed to benefit farmers when the weather-related factors affect the yields of notified crops in the notified area. An attempt is made in Table.2 to estimate proportion of the farmers benefited in relation to total no. of farmers covered under this scheme, by working out the farmer's benefited ratio. For the present paper, the farmer's benefited ratio is calculated by using the following formula:

IJMDRR
E- ISSN –2395-1885
ISSN -2395-1877

$$\text{Farmers Benefited Ratio (FBR)} = \frac{\text{No. of Farmers Benefited by this scheme}}{\text{No. of Farmers Covered under this Scheme}} \times 100$$

Table - 2. Farmers Benefited Ratio – Season-wise

Year	No. of Farmers		Season-wise Farmers Benefited Ratio (%)		
	Covered(in Lakhs)	Benefited(in Lakhs)	Kharif	Rabi	Total
2007-08	6.78	2.26	80.6	30.0	33.3
2008-09	3.75	2.30	59.4	63.0	61.3
2009-10	23.63	15.03	77.8	50.0	63.6
2010-11	93.02	43.19	36.4	57.6	46.4
2011-12	116.74	63.29	52.1	57.3	54.2
2012-13	136.21	108.03	84.3	72.2	79.3
2013-14	140.89	79.71	75.0	25.2	56.6
2014-15 (P)@	80.92	0.06	0.08	--	0.08
All Years	601.94	313.88	42.6	55.2	52.1

Note: @ Kharif season only, Source: Calculated from: Agricultural Statistics at a Glance-2014, Government of India, pp.352, 353.

The data presented in Table. 2 indicate that the no. of farmers benefited as the proportion of total no. of farmers insured ranges from a low of 33.3 per cent in 2007-08 to a high of 79.3 per cent during the year 2012-13. If we see the season-wise proportion of farmers benefited, the data show that the farmers benefited ratio was high at 55.2 per cent in Rabi season during the 8 years reference period, compared to the proportion of 42.6 per cent in Kharif season and on an average the ratio of farmers benefited works out to 52.1 per cent, for an agricultural year. At disaggregated level, the farmers benefited ratio was found high at 84.3 per cent, 80.6 per cent and 77.8 per cent for the Kharif season during the years 2012-13, 2007-08 and 2009-10 respectively. It is seen that the mean for Kharif season was 42.6 per cent, due to an insignificant proportion of 0.08 per cent for the year 2014-15 and high at 55.2 per cent as the estimates for Rabi season were not included. The ratio for Rabi season, however, was found lower compared to Kharif season. It was high at 72.2 per cent in 2012-13 and lowest at 25.2 per cent in 2013-14. To sum up, the farmers benefited ratio was found high in Kharif season (except for 2014-15) compared to Rabi season.

C. Claims Settlement Ratio

In insurance industry "claims settlement ratio" is given much importance, which serves as an indicator to measure the effective operation of an insurance company and also acts as a motivational factor for improving the insurance business by adding new customers and retaining the old customers. However, for the present paper, claims settlement ratio is defined as the claims paid as percentage of claims payable to the farmers. Guided by this definition, the claims settlement ratio was calculated and the results are presented in Table. 3 to assess the functional efficiency of the weather based insurance scheme.

Table-3. Claims Settlement Ratio in Weather Based Crop Insurance Scheme

Year	Claims Payable (Rs. In Lakhs)	Claims Paid (Rs. In Lakhs)	Claims Settlement Ratio (%)		
			Kharif#	Rabi@	Total (3/2)
(1)	(2)	(3)	(4)	(5)	(6)
2007-08	10564.05	10564.05	100.0	100.0	100.0
2008-09	4947.56	4947.56	100.0	100.0	100.0
2009-10	34508.76	34440.74	100.0	99.6	99.8
2010-11	63461.76	63425.98	99.9	99.9	99.9
2011-12	117664.49	108763.23	99.1	88.7	92.4
2012-13	192748.32	158968.83	91.3	75.3	82.5
2-13-14	148401.62	132122.93	91.0	82.3	89.0
Mean for the Reference Period	81756.65	73319.05	93.5	86.0	89.7

Note: #, @ percentages are calculated by using the data for the respective seasons for all the reference years.
Source: Calculated from Table.14.12 (b)-Agricultural Statistics at a Glance –2014, pp.352&353

The claims settlement ratio as presented in Table. 3 show that it has been decreasing in recent years, compared to the initial years of the introduction of the scheme. It is seen from the data that the claims settlement ratio which was 100.0 per cent in 2007-08 and 2008-09 has begun to decline continuously and it was found low 82.5 per cent in 2012-13, with a marginal increase in 2013-14 touching 89.0 per cent level. Viewed from season-wise claims settlement ratio, it was high at 93.5 per cent for the Kharif season, compared to the Rabi season which worked out to 86.0 per cent. These ratios amply prove the fact that in Rabi season around 14.0 per cent of the claims payable were not paid to the farmers and in Kharif season 6.5 per cent remained due to the farmers. Totally, for an agricultural year, on an average 10.3 per cent of the claims payable was not paid to the farmers for various reasons and it was observed that the reasons for the unpaid claims were not mentioned.

D. Performance of the States

An attempt was made in this paper to analyze the performance of WBCIS in India, based on farmers' benefited ratio and claims settlement ratio. Additionally, a modest attempt was made to estimate the average area insured per farmer and claims paid as the ratio of gross premium collected to measure the comparative operational efficiency of the scheme in the states of India. Table. 4 present these details for the selected states out of 18 states in which the scheme is in operation.

Table- 4. Performance of WBCIS in selected States of India

(Cumulative up to Kharif 2014-15)

S.No.	State	Indicators Used to Measure the Performance			
		Farmers Benefited Ratio (%)	Claims Settlement Ratio (%)	Average Area Insured (Hect. Per Farmer)	Claims Paid(Rs) / Gross Premium Collected (Rs) (%)
1	Rajasthan	49.9	97.2	1.37	57.5
2	Bihar	59.6	65.8	1.02	37.9
3	Andhra Pradesh	70.0	99.9	1.63	74.2
4	Maharashtra	24.7	99.0	0.97	53.1
5	Madhya Pradesh	77.9	92.4	1.66	47.6
6	Karnataka	67.0	99.3	1.23	51.0
7	Uttar Pradesh	49.3	29.2	0.80	12.1
8	Gujarat	34.3	100.0	0.83	38.3
9	Haryana	56.0	233.7	1.68	86.1
10	Orissa	68.3	100.0	1.45	56.8
All 18 States		52.1	89.2	1.30	51.3

Source: Calculated from Table. 14.12 (b)- Agricultural Statistics at a Glance-2014, p.351.

The performance of the states in implementing the scheme is measured by four important indicators as shown in Table. 4. The data presented in the table reveals that viewed from the percentage of farmers benefited to the total no. of farmers insured Madhya Pradesh with 77.9 per cent occupies first place followed by Andhra Pradesh (70.0%) Orissa (68.3%), Karnataka (67.0 %), Bihar (59.6 %) and Haryana (56.0%) . The farmers insured under WBCIS in Maharashtra, Gujarat, Uttar Pradesh and Rajasthan could not get benefits, as the farmers benefited ratio worked out to less than the national average of 52.1 per cent. The claims settlement ratio was found highest in Haryana, Gujarat, Orissa, Andhra Pradesh, Maharashtra, Karnataka, Rajasthan and Madhya Pradesh as it was found higher than the national average of 89.2 per cent. It is found from the data that claims settlement ratio was not encouraging for Uttar Pradesh (29.2%) and Bihar (65.8 %).

However, in spite of higher claims settlement ratio, the average area insured per farmer is low at 0.83 ha in Gujarat, 0.97 ha. in Maharashtra and 1.23 ha in Karnataka. It is evident from the data that in Haryana (86.1%), Andhra Pradesh (74.2 %), Rajasthan (57.5 %) and Orissa (56.8%), major portion of the premium paid were used

for the payment of claims, which results into inadequate funds for recycling the funds for the efficient management of WBCIS. To sum up, if we measure the operational efficiency of WBCIS, Andhra Pradesh, Madhya Pradesh and Orissa are performing well occupying the top ranks with reference to the indicators employed for the present paper.

CONCLUSION

It is a known fact that the vulnerability of resource-poor farmers shackles them into vicious circles and increases the impacts of agricultural risk, particularly in the absence of insurance protection. For a monsoon dependent agricultural economy like India, WBCIS acts as a mechanism to mitigate yield risks and for the stabilization of crop incomes. In spite of these merits of WBCIS, adequate attention towards monitoring and evaluation of this scheme did not receive much attention from academic experts. The recent ASSOCHAM – Skynet study revealed that only 19.0 per cent of the total farmers in India were insured, exposing vast majority to weather vagaries and their observations reveal that in spite of their awareness about insurance schemes, 46.0 per cent of the farmers reported that they were not interested and 24.0 per cent reported that insurance facility was not available and 11.0 per cent reported that they were unable to afford insurance premium. The latest NSSO 70th round survey (2013) revealed that 961 farmer households, 1000 farmer households ,1000 farmer households, 984 farmer households, 969 farmer households and 966 farmer households per 1000 households surveyed have not insured their paddy crop, ragi crop, soya bean crop, bajra crop, maize crop and jowar crop respectively during agricultural year July 2012- June 2013. These figures amply explain the state of agricultural risk management at farmer's level as well as the neglect of authorities to implement the scheme with dedication, though it is vindicated that a one per cent growth in agricultural production reduces poverty by more than one per cent, particularly in India.

Hence, it is suggested that much research is to be initiated towards the crop-specific evaluation studies for the farmer bneficiaries under this scheme. Proper attention is to be paid for improving the claims settlement ratio particularly in the states like Uttar Pradesh and Bihar where it is very low. Similarly, the propelling factors are to be evaluated in the states, where the farmers benefited ratio is found very low like Maharashtra (24.7 %),, Gujarat (34.3 %) and Rajasthan (49.9%)/ The average area insured must also be increased particularly in Uttar Pradesh, Gujarat and Maharashtra, where it is found less than one hectare.

It is also true that marginal (67.1%) and small farmers (17.9 %) who operate with an average land holdings of 0.39 ha and 1.42 ha. respectively according to 2010-11 census, are naturally the most vulnerable groups, with low resource and asset-base. Efforts are to be initiated to estimate the no. of marginal and small farmers insured, benefited under WBCIS along with their social status. No doubt, designing, evaluating and regulating the weather-indexed insurance product is highly technical area and needs the intervention of the Government and technical expertise. Let us hope that with broader analytical and research function, necessary efforts would be made for improving the operational efficiency of WBCIS market across the states of India.

REFERENCES

1. Bharat Ramaswamy, Shanika Ravi and S.D. Chopra (2003) Risk Management in Agriculture: Discussion papers in Economics-03-08, Indian Statistical Institute, Delhi
2. Clarke, D.J. (2011) A Theory of Rational Demand for Indexed Insurance, Economics Series Working Papers, 572, Department of Economics, University of Oxford.
3. Daniel J. Clarke, Oliver Mahul, Kolli N. Rao and Niraj Verma (2012) Weather Based Crop Insurance in India, Policy Research Working Paper :5985, The World Bank and South Asia Region.
4. Government of India (2011) Report on Impact Evaluation of Pilot WBCIS, submitted to the Ministry of Agriculture by Agricultural Finance Corporation Ltd., Mumbai
5. Mahul,O.N, Verma and D.J. Clarke (2011) Improving Farmer's Access to Agricultural Insurance in India, Mimeo, World Bank.
6. National Sample Survey Organization (2013)Key Indicators of Situation of Agricultural Households in India, 70th Round, Jan-Dec, 2013.
7. Raju, S.S., and Ramesh Chand (2008) Agricultural Insurance in India: Problems and Prospects, NCAP Working Paper No. 8.
8. ASSOCHAM and Skynet Study , http://www.assocham.org retrieved on 12-06-2015.