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Short Review Paper

Weather based crop insurance scheme: opportunities and challenges

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Abstract

Agriculture contribution to Indian economy was enormous and play important role in providing employment to nearly about 50-60 percent. But, agriculture is uncertain especially for small land holders since weather and climatic uncertainty with irregular monsoon, and natural disasters along with risk involved in inputs have a considerable impact on yields. Further, Agriculture production and productivity was highly depending on weather and climatic factors which are behind the human control. Reduction of weather related risk experienced by farmers was most difficult task. Loss in farmers crop yields due to adverse weather conditions was successfully addressed by weather insurance and it provide insurance protection to farmers especially in adverse situations. Despite government efforts to implement the scheme to whole country, penetration of the scheme among farming community was very low and unattractive. Hence, Broad based product need to be introduced which cover maximum perils and simultaneously private firm's participation need to be encouraged to provide service to farming community. In addition, with proper training and capacity building program along with improved inputs, advanced technologies and weather infrastructure could protect the interest of farmers and also minimize the risk in agriculture.

Keywords: Agriculture, Weather Based Crop Insurance Scheme, Climatic perils, farming community.

Introduction

Indian agriculture contributes nearly 14 per cent to the country's GDP sustains about 70 per cent of the country population and provides employment opportunities to nearly half of the population. In spite of decline in its share in country's GDP, sector still remains the largest and plays a crucial role in overall socio-economic development of the nation. Nevertheless, farm sector is predominantly an uncertain and risky economic activity, mostly for small and marginal farmers since weather and climate related risks with uncertain rainfall, and other natural catastrophes along with defective farm inputs have a considerable impact on yields[1]. Since agricultural production and productivity are highly dependent on weather conditions, any weather aberrations cause atmospheric and other forms of stresses and in turn, will increase the vulnerability of these farmers to economic losses[2,3]. In the recent past, due to change in climate and weather variability, life of farmers with marginal and small land holding was became more riskier. Risk and uncertainty associated with Indian farming is very high. Management of these kinds of weather risk plays a crucial role to protect the livelihood and ensure sustainable crop productivity for feeding 1.3 billion population of India[4]. In crops requiring higher initial investment, the weather risks may prevent the farmers to opt for high value crops[5]. Weather insurance designed in such way to protect farmers especially in adverse situations and also protect the loss in crop yields from uncertain weather situations.

Weather based crop insurance scheme

A pilot Weather Based Crop Insurance Scheme (WBCIS) was launched in 18 States since from 2007 with objective to bring large farmers under insurance folds. The scheme was implemented by the Agriculture Insurance Company of India Limited (AIC) and private companies. Weather-Index Insurance (WII) is an innovative form of index insurance that covers farmers against weather related extreme events[6]. Under the scheme, payment method was planned in manner that it covers uncertain rainfall may be deficit or excess during *Kharif* season and during *rabi* season it covers adverse incidence in weather parameters like frost, heat, relative humidity and un-seasonal rainfall.

The scheme is rely upon the principle of area approach and with respect to reimbursement government notifies the Reference Unit Area (RUA) as homogenous unit of insurance before commencement of every cropping season. In order to assess the loss-claim and settlement every RUA linked with the Reference Weather Station (RWS) based on that current climatic data and claims could be finalized.

Almost every type of cultivators such as small, marginal and large within any 'RAU' was included under the scheme. On the other hand, the scheme is compulsory for those farmers who availed crop loan for notified crops from any financial institutions[7].

Premium rates under the scheme depend on 'anticipated loss', which further depends on historical weather patterns of periods of more than 25 years. The premium rates are capped for farmers; beyond that are equally shared by both Central as well as concerned State Government on 50:50 ratio. The farmer's premium rates for different crops under the scheme were presented (Table-1).

Advantages and limitations for Weather Based Crop Insurance Scheme: Advantages: i. Reduces adverse selection, ii. Lack of moral hazard, iii. Affordable premium rates to cultivators, iv. Reduces huge data requirement, v. High transparency and objectivity, vi. Ease in field loss assessment, vii. Low operational cost, rapid payout and claims settlement.

Table-1: Rate of insurance premium for various crops payable by cultivator under WBCIS[8].

Particulars	Crops	Insurance premium to cultivators
Kharif	Bajra & Oilseeds 3.5 Per cent or actuarial rate, whichever is less	3.5 per cent or actuarial rate, whichever is less
	Other crops like Cereals, Pulses and other Millets	2.5 Per cent or actuarial rate, whichever is less
Rabi	Wheat	1.5 Per cent or Actuarial rate, whichever is less
	Other crops (other Cereals, Millets, Pulses and Oilseeds)	2.0 Per cent or Actuarial rate, whichever is less
Sl. No.	Premium limits	Subsidies
I.	up to two percent	Nil
II.	More than two to five percent	Twenty five percent, conditional to min. net premiums of two percent owed by farmer
III.	More than five to eight percent	Forty percent, conditional to mini. net premiums of 3.75 percent owed by farmer
IV.	More than eight percent	Fifty percent, conditional to min. net premiums of 4.8 percent & highest six percent owed by farmer

Table-2: Performance of WBCIS[9] (2007 to 2011).

year	Farmers covered (Number in millions)	Area covered (In million hectares)	Amount covered (In m. □)	Premium congregated (In m. □)	Claim payment (In m. □)	Farmers benefited (Number in millions)
2007	0.664	1.041	17515.3	1453.9	1059.6	0.223
2008	0.375	0.482	8873.8	816.9	494.7	0.229
2009	2.362	3.421	49736.9	4476.3	3441.9	1.502
2010	9.295	13.148	143339.6	12302.9	6241.8	4.319
2011	11.616	15.643	209020.2	18524.1	9579	5.988
Total	24.313	33.737	428486	37564.4	20817.2	12.264

Table-3: State-wise performance of WBCIS (*Kharif* 2007 to *Kharif* 2013)[10].

States	Farmers covered (Number in '000)	Area covered (Hectare in '000)	Amount covered (In m. □)	Gross payment (In m. □)	Claim payment (In m. □)	Farmers benefited (No. in '000)
AP	2840	4503	112360	11300	9920	2178
GJ	498	413	2240	220	90	171
Chhattisgarh	214	389	7460	600	620	155
Bihar	8886	9408	215880	18700	13690	6882
Haryana	267	427	13340	1220	500	144
HP	89	1000	4340	500	480	60
Jharkhand	358	342	6560	580	400	294
Karnataka	812	1028	13640	1480	1040	584
Kerala	81	57	1730	180	130	44
MP	942	1662	35630	3180	1720	787
MH	591	679	21120	2530	1800	444
Odisha	316	457	11780	570	320	216
PB	10	30	10	0	0	0
RJ	30200	42046	345770	32370	21140	16692
TN	127	185	3080	300	180	52
UP	447	299	10140	1000	330	203
UK	84	190	2640	320	360	44
WB	103	115	1790	180	140	56
Total	46945	63230	809510	75230	52860	29006

Table-4: Challenges, opportunities and chances for refining weather based crop insurance[1, 4].

Attributes	Weather based crop Insurance
Main challenges	Basic amenities for insurance scheme, Scarcity of weather information and data, Deferred insurance payout, Larger initial cost, Depend on long-term data.
Main opportunities	Quick claim settlement, Low transaction costs (no field visits or yield estimation), Farmers are encouraged for high value crop, Involving private players to offer their product, International markets of risk transfer need to be explored.
Scope for improvement	More focus on advanced technology, Mobilization of farmers towards insurance, Larger publicity and coverage, Lower the indemnity unit, Integration of various schemes, Risk packaging; integrated risk management strategy (insurance as part of broader strategy).

Features of weather based crop insurance scheme

Weather index is a quantitative index which correlates the yield loss of crops with weather variables alone or in combination[11]. Under WBCIS scheme easily measurable weather parameters used for designing the index like rainfall, temperature and relative humidity, etc. Some of the important features of weather index are listed. i. Weather based crop insurance scheme covers most of risks associated with climate such as precipitation, temperature and relative humidity but these climatic factors damages the crop yields the most, ii. Scientific and technological difficulties in planning climatic indices and linking these indices to crop yields losses requires long term weather data of minimum 25 years, iii. Inherent risk associated with climate might be more for precipitation and less with respect to other weather parameters, iv. Fairness and

transparency of the scheme was high. v. Independently verifiable and measurable.

Limitations: i. Basis risk, ii. Non coverage of perils other than weather, iii. Reliability of weather data, iv. Shortage of weather data and weather stations for maintaining reasonably good correlation between index and homogenous area. v. Lack of technical expertise for designing the index using the data and also maintaining long term weather data and stations requires certain expertise Scalability i.e. indices developed for particular crop for particular area not suitable for other areas. vi. Lack of infrastructure especially AWS and other laboratories to provide better correlation in the RUA.

A Way Forward: Modern tools and technologies like remote sensing, UAV technology, drones, sensors etc. may be used for enhancing efficiency in crop yield harvesting and assessing the crops damages. Drones are useful in providing a bird's eye view of farmers land. Satellite images are helps to map crop types, assess the crop yields, appraise the crop loss and damage for crop insurance and also find out appropriate locations for conducting CCEs. UAVs (Unmanned Aerial Vehicles) being used for estimating crop damage and enable quick settlement of insurance claims and payments. Strengthening institutional support, and extension mechanism and capacity building programme for stakeholders for enhancing efficacy of crop insurance. There is need to Scaling up of WBCIS along with Expanding Automatic Weather Stations and Rainfall Data Loggers. For faster claim settlement and transferency there is need to Digitized Land Records through linking with farmer's bank accounts, Aadhaar UID and mobile number. Enhance and improve accountability and transferency through good governance. All the organizations and agencies need to involved in insurance programme for effective implementation of the scheme which is more critical and crucial for successful of any scheme. Role of private players also imperative since their involvement enhance the efficiency through quick settlement of claims amount and less distortion in distribution of government subsidy.

Conclusion

Reduction of weather related risk experienced by Indian farmers is most challenging one. However, weather based crop insurance scheme could be better and improved climate risk management tool available with farmers to protect themselves due to numerous climatic threat resulting in crop yields and income loss. However, penetration of weather insurance scheme among farming community was very low till now and hence, critically formulated need based simplified crop insurance need to be introduced. A developing country like India has huge market potential due to large acreage as well as population involved in agriculture. Broad based product/scheme need to be introduced which cover maximum perils and simultaneously private firm's participation need to be encouraged to provide service to farming community. Linking different stakeholders is necessary to bring down the expenses of the scheme so that profitability of the clients can be improved. With proper training and capacity building to farmers along with improved inputs, advanced technologies and weather infrastructure protect the farming community from risk in agriculture.

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