

CHAPTER 5: SUMMARY AND CONCLUSION

5.1. SUMMARY AND CONCLUSIONS

Despite several strengths and important policy initiatives, the index based crop insurance, especially the weather index based insurance, piloted since 2007 with the government support, at best has been found only partially successful. Based on the findings of this study, the key observations are summarized below:

- i. The WI products analyzed across the competing insurance providers show significant differences in product design, pricing approach, and benefits offered. Given these disparities, only the States with some experience and necessary skills can discern relatively better product from the others.
- ii. Crop yields and weather are closely related, yet given the dynamic nature of the weather and diverse agricultural practices, appropriate designing of a weather insurance product is of paramount importance. The correlation appears better for *Kharif* products where rainfall is the key component, and the WI product is underpaying. In comparison, *Rabi* products, particularly the heat (temperature) parameter show a poor correlation between weather and yield, and WI product often overpaying.
- iii. The present WI product design is complex and poor as an insurance mechanism. Too frequent and too small a payout is what the current WI products are managed to do, defeating the insurance objective.
- iv. Spatial basis risk arising out of lack of adequate density of weather stations appears significant for rainfall data. The spatial basis risk tends to be high for a shorter span of the weather contingency covered, and progressively lowers as the span increases. In other words, closer proximity of weather stations is required for covering rainfall events of shorter span (daily and weekly events).

- v. The trends in weather data analyzed for the selected locations are statistically significant for some locations and for certain parameters, while economic significance of the trends appear to be far more significant, particularly from WI product point of view.
- vi. The majority of the States feel that both operationally and structurally the NAIS is a better product than WBCIS and MNAIS. It appears that the States' preference is driven by narrow considerations of logistics and control, rather than of risk coverage and farmers' expectations / needs.
- vii. States are aware of the strong and weak aspects of yield index and weather index insurance products, and are in favour of a 'hybrid' product like a 'double trigger' product, wherein weather trigger can provide quick and early payout, and subsequently, yield trigger can pay for the residual risks not captured by weather index.
- viii. The study has revealed that there is certainly a demand for crop insurance among the farmers. Farmers practicing crop production under irrigated conditions have shown higher interest in crop insurance than the farmers dependent on rainfall for crop production.
- ix. The awareness about crop insurance is primarily driven by the level of education, size of landholding and type of farming. Most of the farmers have been found aware about the weather advisories; however, the number of farmers considering them useful is low.
- x. Farmers believe that there has been a decrease in the number of the rainy days and the volume of seasonal rainfall over the years. Further, the length of dry-spell and incidence of unseasonal rainfall have increased considerably.
- xi. Insurance providers seek standard market practices, like product benchmarking, transparency in competition and weather data standardization

5.2. RECOMMENDATIONS

Despite some perceived shortcomings and challenges, weather index insurance has the potential to be used as an important adaptation strategy to mitigate the risk of climate change. Keeping in mind these potential benefits, a few suggestions have been made to help the policymakers to deploy weather index insurance as a critical component in agriculture risk mitigation. Broadly, these areas fall in different categories, viz., product design, weather data & standards, financial literacy & awareness, distribution

network, and resolving of queries. Some of these suggestions which can play an important role in scaling of weather index insurance are discussed below:

1. **Product Innovation** - A weather insurance product is complex yet limited in scope. It has to provide reasonable benefits vis-à-vis area yield insurance which is comprehensive in nature. In order to combine the strengths of area yield insurance and weather insurance, it is suggested that to combine both these products into a 'double trigger' insurance product, wherein a part of the payout could be made based on weather index and the rest, using yield index. Further innovation could be combining the traditional insurance for localized risks like hailstorm, landslide, etc. with weather index insurance, particularly for high-value crops.
2. **Improving Weather Station Density** - An ideal weather insurance product should have the least radius of insured farms from the location of weather stations. The ideal radius of five kilometer would need about 50,000 weather stations in the country. To make this challenging task possible, it would need 'public-private partnership' in setting up weather stations. It is also worthwhile to look at new technologies wherein macro level weather data sets can be downscaled to micro level using data from meteorological satellites.
3. **Technical Support Unit** - Many implementing states do not have the needed expertise and data tools to evaluate the products offered by multiple insurance providers. The best way competition could be made use of is to strengthen and hand-hold the states with data sets, technical training, review reports, advice, etc. by setting up a centralized Technical Support Unit (TSU) at the central level in the Ministry of Agriculture. The core functions of TSU may include:
 - i. Create a 'centre of expertise' to support the development and up-scaling agricultural insurance;
 - ii. Establish a core team of agriculture insurance experts to provide technical support to insurance providers in underwriting, product development, pricing, product delivery, grievance redressal, etc.;
 - iii. To hand-hold the States in evaluating the insurance products and choosing the best and effective insurance products:

- iv. Create and manage a centralized database of agricultural and weather statistics, and make the database available to agricultural insurance practitioners; and
 - v. Promote the exchange of expertise among insurance providers and access to international best practices through training courses, operation manuals, and other means.
4. **Value-Added Services** - With weather forecast and agro-advisory services delivery playing an increasing role in farmers' risk management, the crop insurance penetration could be given a boost by providing value-added services like weather forecasts, agro-advisories to the insured farmers, as an add-on or free service.
5. **Financial Literacy and Education** - The need for proper and adequate knowledge about insurance, particularly crop insurance is felt not only at the farmers' level but also at the policymakers' level. The government should mount a structured and sustained awareness generation and financial literacy drive to make weather insurance a well understood risk mitigation mechanism.
6. **Convenient Delivery Channels** - Loanee farmers are well serviced though, but the non-loanee farmers are not provided the convenience of easy enrolment. With great strides in rural infrastructure and tele-communications, the village level institutions like post offices, common service centers, agri-input dealers, etc. should be explored to service the non-loanee farmers.
7. **Grievance Redressal System** - The participating farmers can be ambassadors for propagating insurance products if they understand the products, how and when a payout is made and their grievances if any are redressed within a, reasonable time. It is, therefore, suggested that the insurance providers should put in place a sound and effective redressal mechanism, including the provision for online grievance registration and resolution.
8. **Crop Insurance Survey** - Presently NSSO survey on agriculture sector has just one question on crop insurance. NSSO surveys are the most significant and statistically sound longitudinal surveys conducted across the length and breadth of country. Given the importance and the

scale of NSSO surveys it would be very useful if some more relevant questions on crop insurance are incorporated into the survey.

5.3 DIRECTIONS FOR FUTURE RESEARCH

Weather index insurance has changed the way crop insurance is approached. What began with a small-scale pilot of innovative crop insurance products for farmers in 2003, with the government support, has expanded into a larger program annually insuring over 10 million farmers. This is a commendable progress. However, sustaining the current interest and further growth on long-term basis is possible only with better product designing consistent with changing weather patterns, and lowering the basis risk, backed by concerted efforts on creating financial literacy, providing convenient and cost effective delivery channels, with transparent and appropriate grievance redressal mechanism. A few key areas of future research may include:

1. The assessment of weather trends in the present research is based on a few selective (though representative) locations of the country. A comprehensive study of representative locations within each agro-climatic zone would be useful for designing relevant and appropriate weather index insurance products.
2. Basis risk presents a vast challenge for adaption and expansion of weather index insurance, and the present study has provided a glimpse into the challenge. There is a considerable scope for assessing the basis risk, both product and spatial, across the country. This without doubt, would contribute to more appropriate product designing and acceptability of the weather index insurance.
3. To minimize the spatial basis risk the weather station density has to increase many times. While it may take many years and huge investment, it may be worthwhile to conduct research on the economic cost benefit analysis of investments in weather stations, technologies like

Terrestrial Observation and Prediction Systems (TOPS¹⁹), or a decrease in the insurance unit size for area yield indices (to minimize spatial basis risk).

4. Dedicated research with focus on weather index insurance by research institutions and agricultural universities could be useful in designing products with lower product basis risk, improving the insurance utility value.
5. Involving the stakeholders in product designing is a key to scaling-up weather insurance. There should be a structured and concurrent process to obtain the feedback and suggestions from the stakeholders, particularly the farming community. The insurance providers and the government should evolve an appropriate mechanism in this direction.

¹⁹ TOPS technology is a data-modeling framework designed to integrate surface weather, satellite data with empirical / mechanistic models to monitor and predict crop growth profiles, crop stress and yields. One of the key functions of TOPS is to collect, process and grid surface weather observations to generate spatially continuous fields of meteorology that in-turn can be used in modeling ecosystem, agricultural water and carbon budgets