

# Index-based Weather Insurance – Exploring Demand and Take-up

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- I. Unpredictable rainfall is the dominant weather-related production risk in agrarian regions, especially in semi-arid areas where cultivation is primarily rain-fed (Skoufias et al., 2010; Dercon et al., 2005). In fact, Parchure (2002) estimated that in India about 90% of variation in crop production levels is caused by variation in rainfall levels and patterns<sup>1</sup>. Recent innovations in the agricultural insurance industry have led to the creation of index-based weather insurance, a product in which an exogenous publicly observable parameter is used to determine insurance payouts. The product reduces the risk of both moral hazard and adverse selection and provides efficiency gains by eliminating the need for in-field assessments. However, existing evidence indicates that take-up rates for index-based weather insurance products is extremely low even when actuarially-fair rainfall insurance contracts are offered (Cole *et al.*, 2009). In brief, this research study seeks to further examine the existing low market demand for index-based rainfall insurance through a randomized experiment in an environment where informal risk-sharing networks exist.
- II. Policy makers involved in decisions relating to the strategic growth and development of the agricultural insurance market should utilize this research to better understand the current market demand constraints for insurance in rural agrarian communities. Along with examining the existence and impact of informal risk sharing contracts on take-up of formal agricultural insurance this research also evaluates the impact of pricing and marketing on purchasing decisions and explores new potential customer segments.
- III. This policy brief is targeted at both policy makers and industry practitioners who would benefit from reviewing the studies' research findings on the demand constraints effecting take-up of index-based weather insurance.
- IV. Policy Implications
  - In India, the demand for insurance in rural communities is affected by household membership in informal risk-sharing networks (jatis) which provide varying levels of financial protection against both household and community level shocks.
  - There is evidence of a high demand for index-based weather insurance amongst the agricultural collie (labour) population:  
We offered our index-based rainfall insurance product to agricultural labour populations and find that while cultivator households do purchase on average 2.5 times more units of insurance, the demand for the product is actually equal (as a percentage of households within each sample) amongst cultivator and labourer households. Taking into account differences in income this is a significant indicator for strong demand amongst the agricultural labour population.
  - Basis risk differentially effects take-up of insurance across informal risk-sharing communities:  
Basis risk or the potential for discrepancies in measurements taken at a reference weather station and the realized weather parameter taken at a farmers plot is one of the major risks of an index-based weather insurance product. Due to discrepancies in these measurements, the purchaser may not insure against his

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<sup>1</sup> In a household survey conducted in Andhra Pradesh, 89% of surveyed rural landowners cite drought as the most important single risk they face (Gine et al. 2008).

*real* losses. In our study we examine the effects of basis risk on purchasing decisions and find that introducing basis risk creates a complementary between informal risk sharing and the gains from index insurance: informal risk-sharing communities that are better able to insure individual losses may have a greater demand for index insurance. It demonstrates that in the absence of basis risk, farmers choose full-coverage, actuarially-fair index insurance, independent of the community's ability to informally insure against idiosyncratic losses.

- Variation in the marketing script provided to customers at the time of purchase has a small but significant impact on the take-up of insurance:

In our study we varied several components of our 'marketing script' in order to evaluate whether how a product is "marketed" significantly impacts purchasing decisions. We find that across our sample, using a marketing script where the index-insurance is referred to as a financial product as opposed to an insurance product, produces a positive effect on take-up by 3 percentage points, significant at the 10% level, as opposed to using a regular or "normal" marketing treatment where the product is simply referred to as insurance. This seems to consumer trust or comfort with the idea of insurance.

## V. Implementation

The research findings from this study should be utilized in efforts to expand and further develop the market for weather-based agricultural insurance. The action points listed below suggest feasible steps which can be taken by policy makers and industry practitioners in order to enhance the demand for index-based weather insurance amongst rural agrarian households.

- Acknowledge the role of agricultural insurance in providing financial security and protection to households involved in agricultural production.
- Support information campaigns aimed to increase awareness and understanding of index-based weather insurance products amongst rural communities, particularly low-income households.
- Build support for weather-based insurance products which are designed and targeted at agricultural labourer households.
- Support micro-insurance initiatives and capacity building measures, particularly those that aim to establish effective distribution networks for the sale of weather-based insurance.
- Encourage improvements in measurement accuracy (reduction of basis risk) for index-based weather insurance through increased installation of Automatic-weather stations.
- Continue with price subsidies as they consistently have the greatest effect on take-up of insurance.

## VI. Dissemination:

The academic paper "Selling Formal Insurance to the Informally Insured" and the policy paper "Some Policy Lessons from Marketing Monsoon Onset Insurance in Tamil Nadu, Uttar Pradesh and Andhra Pradesh, India" should be circulated amongst professional researchers, policy makers and practitioners involved in the agricultural insurance and the micro-insurance industry. Organizations or individuals who operate in the Indian market would be particularly interested in these papers as they provide much contextual evidence on the market and demand for weather based agricultural insurance products.

## VII. Further Readings:

Two additional readings that significantly add to the discussion of rainfall insurance markets in India are Xavier, G., et al., "Patterns of Rainfall Insurance Participation in Rural India" (2008) and Cole, S., et al., "Barriers to Household Risk Management: Evidence from India" (2010). Both papers further the discussion on demand constraints and potential impacts of index-based weather insurance.