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SmartLessons

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Making Insurance Markets Work for Farmers in India

India's crop insurance program is the world's largest with 25 million farmers insured. Yet 85 million farmer households are not covered. Issues in design, particularly related to delays in claims settlements, explain the low coverage. To address these problems, the World Bank provided actuarial inputs, engaged in policy dialogue, and facilitated the launch of an innovative crop insurance program that would improve equity, risk mitigation, and claims settlement for farmers; provide tools for budget management and agricultural policy for government; and open up the market for public- and private-sector insurers and reinsurers. Initially, the program will be available to an estimated 8 to 10 million farmers, of whom 3 million are expected to participate in the first year with a total sum insured in excess of \$1 billion. Over time, this project could be scaled up to be available to India's 110 million farmers. This SmartLesson describes lessons learned in developing and implementing the crop insurance program.

Background

The need. With a high degree of dependence on rain-fed cultivation, India needs a well-developed and widely used agriculture insurance program. For more than 110 million farmer households (of whom 80 percent are small and marginal farmers operating less than two hectares), access to risk mitigation for crop production is critical. Otherwise, they run the risk of crop failures, which in turn, leads to an inability to service debts. Because successive crop cycles follow seamlessly from one to the next, delinquency on account of one crop failure means being ruled out of the formal banking system, leading to dependence on high-cost informal sector credit and a potential debt trap. Crop insurance also helps enhance the viability of agriculture lending through risk mitigation and hence is vital for banks.

The response so far. The government of India (GOI) has historically focused on crop insurance as a planned mechanism to mitigate the risks of natural perils on farm production. The National Agriculture Insurance Scheme (NAIS), implemented by the public crop insurer, the

Agriculture Insurance Company of India (AICI), is the main crop insurance program in the country and has been supplemented more recently by the Weather-Based Crop Insurance Scheme (WBCIS).

The broad structure of NAIS is technically sound and appropriate in the context of India. NAIS is based on an indexed approach known as the area yield-based approach, where the index used is the crop yield of a defined area called an insurance unit (IU, e.g., an administrative block). The actual yield of the insured crop, measured by crop-cutting experiments in the IU, is compared to historical yields. If the former is lower than the latter, all insured farmers in the IU are eligible for the same rate of indemnity payout. Individual crop insurance would have been virtually impossible, given the large number of very small landholdings. Further, using the area yield-based approach has other merits. Most importantly, it mitigates moral hazards and adverse selection.

The problem. NAIS is funded by post-disaster government contributions, entailing an open-ended and highly variable fiscal exposure for

the government. Being subsidized, the annual claim/farmers' premium ratio is higher than 100 percent. At the end of the crop season, aggregate claims exceeding the farmers' premium, are funded 50-50 by the state and central governments. India's post-disaster funding arrangement, which, in turn, was necessitated on account of a lack of an actuarially sound premium rating methodology without which estimating payouts is not feasible, is not optimum for budget management for the GOI and delays claims settlement, leading to farmers' distress and exposing them to a vicious debt cycle. This situation explains NAIS's low coverage (20 percent) and that of banks lending to farmers (45 percent).

The solution. The GOI asked the World Bank to improve the crop insurance program through an actuarially sound rating methodology that would improve the design of NAIS and reduce delays in claims settlement. The Bank was asked to propose design and ratemaking of new weather index insurance products under the WBCIS, perform a risk assessment of AICI's insurance portfolio, and suggest cost-effective risk financing solutions (including reinsurance). The project, conducted in three successive phases, culminated in 2010 and entailed working closely with the client and national and international experts. The Bank also provided capacity building in the form of quarterly visits by the Bank's team (including a certified actuary) and monthly teleconferences.

This work started with funding from the Swiss Development and Cooperation Agency (Phase 1, 2005) to engage a dialogue with the GOI on agricultural insurance. During Phase 2, 2005–2007, the FIRST Initiative provided technical and financial assistance for the development of an actuarially sound product design and ratemaking methodology for the NAIS and the WBCIS. Under Phase 3 (2008–2010) of the nonlending technical assistance (NLTA), funded by the Global Facility for Disaster Reduction and Recovery, the actuarial methodology developed under Phase 2 was made operational through the development of prototype actuarial software and intensive technical capacity building. In addition, these actuarial and risk assessment tools were used as part of a policy dialogue on the fiscal impact of agricultural insurance.

The NLTA Project produced the following key outputs and milestones:

- a detailed review of NAIS, including its underwriting and ratemaking methodology.
- development of a best practice standard actuarially sound ratemaking procedure (as a public good) using an experience-based approach for area-yield insurance. This became the foundation for a move to an ex-ante, market-based crop insurance program, as the actuarial prices helped assess farmer, state, and central government contributions to premiums up front.
- development of commercial weather-based crop insurance products, which led to an increase in the AICI weather-based crop insurance portfolio to almost 1 million farmers and a total annual premium volume in excess of \$50 million.
- detailed inputs into the design of the innovative modified NAIS (mNAIS) for India (see Box 1).
- a buildup of AICI's capacity to transition NAIS to a market-based approach.
- a policy dialogue, in parallel with the Ministry of Finance, the Ministry of Agriculture, and the Planning Commission, about the fiscal impact of the modified NAIS for the GOI as well as the welfare implications of the modified scheme
- a decision to launch an mNAIS pilot in 50 districts for three seasons, starting in Rabi in the winter of 2010.
- prototype actuarial software design and pricing of more than 200 insurance products, as well as advice on the use of mobile technology for improving crop-cutting data quality and timeliness.

In September 2010, the GOI approved the mNAIS, reflecting most of the Bank's suggestions, moving from a social crop insurance scheme to a market-based crop insurance program involving the private insurance and reinsurance industry. The implications of this project for the performance and

Box 1. Main Features of mNAIS

- **Actuarial regime:** The mNAIS scheme operates on an "actuarial regime" in which the government's financial liability would be predominantly in the form of premium subsidies given to AICI and funded ex-ante, thereby reducing the contingent and uncertain ex-post fiscal exposure currently faced by the government under NAIS, and reducing delays in claims settlement.
- **Up-front premium subsidies:** AICI receives premiums (farmer collections + premium subsidies from the government) and is responsible for managing the liability of the mNAIS through risk transfer to private reinsurance markets and risk retention through its reserves and is able to operate on a sustainable basis.
- **On-account partial payment:** The mNAIS product continues to be based on an area yield-based approach, with a provision for an early part payment to farmers (in season) based on weather indices.
- **Small IUs:** Crop-cutting experiments conducted to assess crop yield estimates are lowered from the block level to the village level to reduce basis risk (i.e., the mismatch between the actual individual crop yield losses and the insurance indemnity).
- **Cutoff dates.** Adverse selection is reduced through the enforcement of early purchase deadlines in advance of the crop season.
- **Additional benefits.** Additional benefits are offered for prevention of sowing, replanting, post-harvest losses, and localized risk such as hail losses or landslides.

Box 2: Key Benefits from mNAIS

- Actuarial rating enables risk-based pricing and ex-ante estimation of subsidy (better budget management). Risk-based pricing helps differentiate risks and improve equity between farmers (Figure 1 shows highly varied risk profiles within a state although all farmers were earlier paying the same premium under NAIS). Risk-based pricing can also be used for agriculture policy signaling. For example, in the case of a crop with a very high premium rate, the mNAIS could indicate that it should not be grown in a given area, and this could feed into agriculture extension policy.
- Ex-ante subsidy determination enables up-front government and farmer contributions toward premiums, thereby passing residual risks to the insurers (market approach) and enabling fast claim settlements.
- Combining weather-indexed insurance (that allows for quick payments and enables interim payments within a crop season) with area yield insurance (that allows for payouts with closer correlation to yield losses) makes the best use of both indices.
- Improving the underwriting terms and conditions of the crop insurance policy, such as purchase deadlines and additional benefits, makes the product more sustainable.
- Increasing competition and expanding the role of the private sector in crop insurance contribute to the promotion of effective public-private partnerships in agricultural insurance.

sustainability of the mNAIS are monumental: Although initially this product could be available to 8 to 10 million farmers, over time it could be expanded to India's 110 million farmer households with improved crop insurance products and timely claims settlement (see Box 2 for key benefits of mNAIS). The modified scheme crowds in the private insurance sector by allowing domestic insurance companies to offer mNAIS and by attracting international reinsurance capacity. Finally, the GOI will be better equipped to manage its fiscal exposure to natural disasters, while insurance companies will now bear risks and compete to offer products and services to farmers.

Lessons Learned

1) Make sure that any state-of-the-art tools are developed in close collaboration with the client, and be prepared to deploy second-best technical solutions when necessary to reflect on-the-ground realities and political and economic considerations.

Drawing on international best practice and in-country experience, the rating methodology improves pricing of catastrophic losses and allows decomposition between catastrophic and noncatastrophic losses, which helps attract international reinsurance capacity. The rating methodology

ensured the financial sustainability of the program and its relevance to the country context. An open approach helped close collaboration with the client, leading to drawing on their country and domain knowledge to a significant extent, a process which also enabled the Bank team to learn from the client's experience and knowledge.

Adaptations were required in order to make the rating methodology practical. For example, while risk differentiation is desirable from an actuarial viewpoint, applying it to each IU (left side, Figure 1) would have been difficult because of political and administrative constraints. A second-best approach was deployed, using district pricing (right side, Figure 1) and a strategy to keep the nominal price constant but vary the coverage levels (insurance deductibles).

2) Design technical tools that can pave the way for policy dialogue.

The actuarial tool by itself was the defined output sought by the client. These actuarial tools were used as the basis for a shift from ex-post to ex-ante funding. They were also used to demonstrate efficiency and the political and economic gains possible through faster claims settlements. The tools therefore helped translate technical work into policy dialogue. The result was the launch of a new program potentially benefiting India's 110 million farmers in the coming years.

Figure 1. Pure Premium Rate at 90% Coverage Level, Rice Crop in Province A

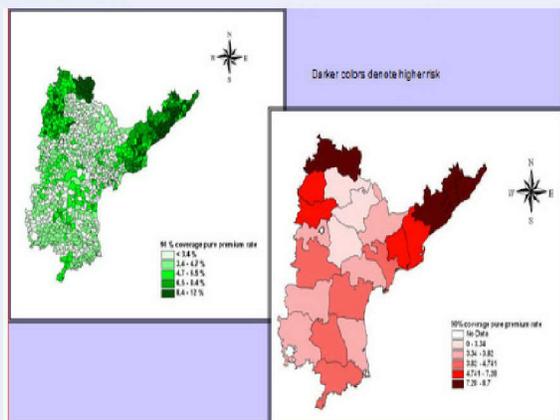
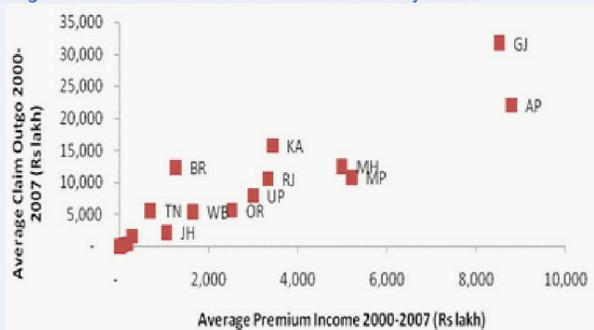
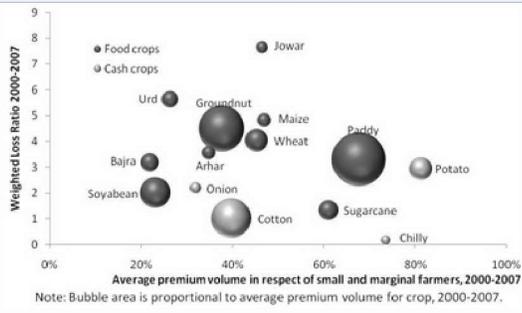


Figure 2. NAIS Premium Income and Claims by State



Note: Rs 1 lakh is approx. \$2,500.

Figure 3. NAIS Loss Ratio for Major Crops, 2000-07



Further, actuarially sound premiums signaled the true cost of growing a given crop in a given district and informed decision makers about the viability of some crops in some regions and the social cost of maintaining them. The actuarial tools were also used to inform policymakers about the fiscal impact of public premium subsidy programs, assess targeting (coverage of crops and small and marginal farmers versus others), and analyze the associated wealth transfers between the central government and the states (Figures 2 and 3).

3) Invest in extensive institutional capacity building and technical inputs for both the implementing agency and policymakers.

Agricultural insurance is a highly specialized line of business that requires intensive institutional capacity building. Major efforts were invested to ensure that the proposed technical recommendations would be fully understood and implemented. Anchor and regional staff, with the assistance of an international certified actuary, provided intensive training to AICI technical staff through technical documents, monthly teleconferences, and quarterly on-site visits.

4) Combine traditional and innovative crop insurance.

Although much of the development literature and debate in India and elsewhere center on traditional versus new generation (weather-based) insurance, the team here used technical grounds to demonstrate the benefits of combining the two approaches, based on their respective comparative advantages. Weather-based indices are used for on-account partial payment of claims in case of adverse mid-season conditions, while area yield indices are used for final payment of claims.

Conclusion

The shift from a social crop insurance program with ad-hoc funding from the GOI to a market-based crop insurance program where the product design and premium rates are actuarially sound makes the Indian crop insurance program attractive for private insurance and reinsurance companies. Two domestic private insurers already agreed with some states to offer mNAIS in Rabi in 2010. The public insurer AICI is currently looking for international reinsurance capacity for its mNAIS insurance portfolio.

The piloting of mNAIS is under way in 50 districts (around a tenth of India). This is a major step forward and can help improve risk mitigation for farmers, benefit lenders to farmers, improve budget management, and develop private insurance markets. However, key challenges remain, including improving yield estimation, promotion of the product, and streamlining of the budget processes. The Bank team is in discussions regarding follow-up support for institutional capacity building, implementation assistance to increase outreach, and further fine-tuning of the product to support development of the crop insurance market.



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