Overview of Farm Level Index Insurance in Malawi

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IRI is working with partners to provide financial instruments that help smallholder farmers cope with climate risk in Malawi. Because climate risk has made it infeasible for microfinance institutions to provide stand alone loan products to farmers, farmers have not been able to obtain the high quality seeds and fertilizer that they would like to use. If these inputs were available, the farmers could enjoy substantially increased yields.

With World Bank CRMG support, IRI has designed the contracts for a drought insurance system that provides the backbone for a package of loans, groundnut, and maize inputs for smallholder farmers. The insurance targets the financing risk, allowing farmers access to loans, which, in turn provide access to inputs, and the cash necessary to pay for the insurance premium.

This package is possible because of a new innovation in insurance. Traditional insurance contracts insure against crop failure, but these lead to perverse incentives to farmers to allow the crops fail. There is also an incentive for less productive farmers to buy insurance and for more productive farmers not to buy insurance. These problems would lead to more payouts, which would in turn lead to higher premiums, which has ultimately made this type of insurance too expensive to be workable.

To address these problems, the new insurance contracts are written against an index. In Malawi, this index is based on rainfall. Farmers have correct incentives to make productive choices, because allowing crops to fail does not increase the insurance payout. Index insurance is also cheaper to implement because the insurance company does not need to send auditors to the field to verify damage. However, the farmer is no longer insured against the damage of crop failure, but only against drought. If crops fail for a reason other than drought, then the farmer receives no compensation. Because index insurance does not protect against all risks, it is only used to target a key risk that has undermined other mechanisms.

The pilot project in Malawi is insuring groundnut farmers against drought during critical growth periods. So far it appears to be successful. A total of 892 farmers bought groundnut insurance in 2005 and several thousand contracts were sold to farmers in 2006, for groundnuts and Maize. Future plans for the project are likely to involve additional crops. Farmers have reported that this insurance is their main strategy for adapting to climate change.

Partners in the project include Malawi farmers, financing associations (OIBM, MRFC, Malawi Insurance Association), the national farm association (NASFAM), the World Bank CRMG, the Malawi Met Service, and CUCRED. Scale-up in Malawi is primarily limited by the logistical challenges of education and signing of contracts for large numbers of new farmers, as demand is overwhelming. The program is financially self-sustaining, with farmers paying their own input costs, insurance premiums, interest, and even taxes (although for maize, some farmers do receive government subsidized fertilizer). In interviews, farmers have reported that the way that they adapt to climate change and variability is by enrolling in the insurance program.

The insurance is a part of a finance/production bundle, designed for 1 acre of production. To be eligible, a farmer must be within 20km of one of the Met Stations in the program. Current sites include in Lilongwe, Chitedze, Kasungu, Nkhotakota, and Mchinji. A typical groundnut package consists of a loan (~4500 Malawi Kwacha or ~$35) that covers the groundnut seed cost (~$25, ICRSAT bred), the insurance premium (~$2), and tax (~$0.50). Upon signing the paperwork, the farmer receives a bag of groundnut seed sufficient for 1 acre of production and an insurance certificate for a policy with a maximum payout of the loan size plus interest (~$7). The prices vary of course by weather station and crop. Farmers are organized into joint liability groups of approximately 10 members. The farmers plant the groundnut seed, and at the end of the season provide their yields to the farm association, which markets the yields. Proceeds and insurance payouts are used to pay off the loan, with profits returned to the farmer.

All contracts are based on dekadal (10 day) rainfall summations. Dekadal totals were limited to maximum levels (caps). Any rainfall above the cap within a dekad is not considered in the payment formulas. A

"sowing window" is set for each contract with a start dekad and an end dekad. The contract calendar begins in the first dekad of the sowing window for which rainfall exceeds a threshold amount, the "sowing trigger." If the trigger is not exceeded during the window, a failed sowing condition is signaled, a failed sowing payment is paid, and the contract is terminated. If the sowing trigger is reached, the contract calendar begins with the dekad in which the trigger was reached. The contract calendar is broken up in to three of phases of several dekads each.

The payout function for each phase has three parameters, an upper trigger, a lower trigger, and a maximum payout. If the capped rainfall total during a particular phase is more than the upper trigger, no payout occurs for that phase. If the rainfall total is less than the lower trigger, the maximum payout is rewarded. If the rainfall total is between the upper and lower triggers, the payout is linearly interpolated between the zero level payout at the upper trigger and the maximum payout at the lower trigger using the simple linear formula below (with an example illustrated in the figure).
Payout = (1 – (Rainfall Sum – Lower trigger) / (Upper trigger – Lower trigger)) Max Payout
The total payout is the sum of the payouts for each phase and limited to the maximum payout size. Contract timing and parameters are determined using agronomic models and rainfall data in a numerical optimization that minimizes the variance in income that a farmer would face subject to a maximum premium constraint.

The project has a different strategy than the famine relief insurance in Ethiopia pioneered by the Ethiopian government, the WFP, World Bank CRMG, and other partners. In the Ethiopia project, the insurance is designed to stabilize the budget of relief agencies. However, in the Malawi micro-insurance project, the insurance is designed to remove drought related barriers in access to credit and input for smallholder farmers so that they can increase their productivity. The Malawi micro-insurance is not designed to address famine, and NGOs and the Malawi government will be required to respond to famine crises. Working with the World Bank CRMG, national-level index insurance and related financial strategies are being explored by the Malawi government for famine relief to supplement the micro-level activities.

Farmers in the program are aware of the relationships between ENSO and seasonal precipitation but have expressed frustration because they cannot take actions to benefit from this knowledge. They have articulated an interest to shift their crop mix to take advantage of seasonal forecasts, increasing the fraction of their land with drought tolerant crops in response to dry forecasts years and shifting towards higher risk but higher productivity crops in response to wet forecasts. Because the farmers have complained that the appropriate seeds are not available or affordable, IRI is working to build the forecast into the insurance package, so that the insurance package reflects the best mix of seeds and financial tools for the seasonal rainfall probabilities expected. We are developing similar programs in Kenya, Tanzania, and other locations.