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Weather insurance for smallholder tobacco farmers in Malawi

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Agriculture is the backbone of Malawi's economy: it accounts for about 34 percent of gross domestic product (GDP), over 90 percent of export earnings, and employment of 85 percent of the population through farming, processing, transportation, and marketing. Given this, and that most farming in Malawi is rain-fed, both Malawi's economy and smallholder farmers are highly vulnerable to variability in rainfall. Since 2005, the World Bank has piloted index-based weather insurance (IBWI) in Malawi to reduce climate-related risks to the agricultural sector. Maize and groundnut farmers were initially targeted, and the pilot programs were expanded in 2007 to cover loans provided to participating smallholder tobacco farmers. In the event of a drought or excess rainfall, the insurance repays part of or the entire loan. The main objective is to reduce loan defaults resulting from weather shocks, increasing farmer access to credit in the future.

The Malawian government is now investigating the potential benefit of scaling up weather insurance, to include additional locations, crops, and farmers. However, there is insufficient evidence to determine whether scaling up is feasible and advisable. A new study by Mwiriha Kapondamgaga, using 270 randomly selected burley tobacco farmers in the Kasungu Agricultural Development Division (ADD), helps to fill this information gap by investigating the profitability of and demand for weather insurance. This policy brief summarizes the study's key findings.

Is index-based weather insurance profitable for smallholder burley tobacco farmers in Malawi?

Farming tobacco, Malawi's main cash crop, is primarily aimed at maximizing profit. Therefore, tobacco farmers will decide whether or not to invest in weather insurance by comparing expected profits with and without such insurance. Kapondamgaga's study used 2010 enterprise budgets to estimate the profitability of weather insurance in a year without any rainfall shocks. Profits were estimated from market prices for burley tobacco, fertilizer, chemicals, and labor, for three categories of burley tobacco farmers – weather-insured, uninsured, and non-participant (those that did not purchase insurance or take out a loan). The analysis assumed that participating farmers pay the premium for weather insurance, although lending institutions presently pay. Enterprise budget results showed that the profit per hectare was higher for uninsured farmers (US$820) than for weather-insured farmers ($708) and non-participants ($702). These differences were statistically significant. Other differences among the three categories of farmers, aside from insurance and loans, may be playing a role as well, since farmers were not randomly assigned to each category. Comparison of other socio-economic variables (household member's ages, gender, marital status, education, and years of farming experience; household labor availability; landholding size; household income; and access to extension information) for farmers in the three categories showed statistically significant differences in the availability of household labor, landholding size, and years of farming experience.

Results of Kapondamgaga's study clearly show that, in a year with no rainfall shock, production of burley tobacco by Malawi's smallholder farmers is more profitable with an uninsured loan or no loan than with a weather-insured loan. When drought or excess rainfall are not present, weather insurance, in its current form, is equivalent to an increase in the loan interest rate. In years when there is drought or excess rainfall, the weather-insured farmer would reap benefits from repaying the insured loan to the bank; assistance in this repayment would reduce the likelihood of defaulting on the loan, increasing one's chances of having access to future loans. In contrast, the uninsured farmer would be fully responsible for loan

repayment and may default on the loan, lowering the likelihood of then having access to future loans. In years when there is drought or excess rainfall, both insured and uninsured farmers would experience declines in profit because lower tobacco yields decrease farmer income.

It is important to point out that Kapondamgaga's method for assessing the profitability of IBWI was not ideal. A better method would involve a multi-period model that simulated the probabilities of drought and flooding and the subsequent impacts on profits for farmers randomly assigned to three different categories: with IBWI and the loan, with the loan but without IBWI, and without either IBWI or the loan. Kapondamgaga's study was unable to use a sophisticated simulation model with randomized control study data, owing to time and money constraints. To better assess the profitability and feasibility of IBWI for smallholder farmers in Malawi, future research should use these more sophisticated approaches.

Is there demand for index-based weather insurance among smallholder burley tobacco farmers in Malawi?

For burley tobacco farmers in Malawi to adopt weather insurance, they must first be aware that it is available. IBWI has been piloted to date through a portfolio approach: the lending institution assumes the risk, rather than the farmer. Kapondamgaga's survey found that only 3 percent of respondents were aware that weather insurance was available, and all of these respondents were in the weather-insured pilot group.

Kapondamgaga measured demand for weather insurance by surveying farmers. The farmers were informed that weather insurance would require payment of a premium equivalent to 5 percent of the total amount of the loan, plus a 16.5 percent surtax on the premium and then asked if they would be willing to purchase insurance for the following season. Only 39 percent were willing to purchase the insurance. Of the 61 percent that were unwilling, many felt it was not affordable at the beginning of the agricultural season; 52.6 percent explained that the premium was excessive and 47.4 percent said it would increase the loan interest rate. Only 46 percent of surveyed farmers considered weather insurance on the loan to be adequate protection against tobacco production risks. The farmers stated that other production risks should be covered by insurance, such as hailstorms, heavy winds, and pests and diseases. Farmers also mentioned price risk as a major marketing challenge.

An analysis was done to determine the main factors influencing demand for weather insurance on loans.. Results show farmers' willingness to pay for weather insurance increased with their ability to pay, measured by landholding size and net household income. Education and years of farming experience also had a positive influence on demand for weather insurance. Age of the farmer was found to be negatively associated with demand for weather insurance, possibly because older farmers had a better understanding of the risk and hence considered the premium to be excessive. The farmer's age may also proxy his level of risk aversion, given that several studies have found farmer risk aversion to increase uniformly with age. Finally, as expected, a farmer's perception of the similarity of rainfall at the nearest weather station to that in his field was positively

Children in a tobacco plantation, Malawi.
Photo credit: World Agroforestry Centre on www.flickr.com

correlated with his willingness to pay for insurance. Information on perceptions was collected by asking farmers how similar they believed the rainfall level at the nearby station was to the rainfall received on their field: very similar, similar, slightly similar, or not at all similar.

Policy recommendations

Weather insurance is an important option for farmers, as increasingly the agricultural sector faces climate variability and change. Under the current IBWI program for smallholder burley tobacco farmers in Malawi, microfinance agencies bundle credit with weather insurance to minimize the loan default rate in the event of weather-related crop failure. This form of weather insurance offers substantial benefits to smallholder farmers when weather shocks occur, because it reduces their loan liability, which makes it easier for them to repay loans and ensures access to future agricultural loans. However, the current approach to weather insurance must be modified if the goal is to stabilize profits of smallholder burley tobacco farmers in the face of weather shocks. In particular, the insurance needs to cover both the loan and the farmer's expected income, since smallholder tobacco production costs usually exceed the amount of the IBWI loan, often by a considerable amount. Finally, other weather events, in addition to drought and excess rainfall, should also be considered for insurance coverage, depending on local conditions.

To encourage the expansion of IBWI the government may have to subsidize the premium, at least for low-income households. Kapondamgaga's study found that farmers were unwilling to pay for weather insurance on loans primarily because they considered the premium to be too high, and that household income had a strong, positive influence on demand for insurance.

Given the finding that a farmer's willingness to pay for weather insurance is influenced by assessment of basis risk, insurance contracts should be tailored for each local area. Additional automated weather stations should also be installed in close proximity to farms producing target crops. This provides further justification for recent efforts by Malawi's government to better determine relationships between rainfall and crop production by upgrading the national network of rainfall stations and data analysis capabilities.

Education was another key factor influencing a farmer's demand for weather insurance; therefore, expansion of farmer education and training through extension programs on weather insurance is vital. Weather insurance education should also be incorporated into farm loan orientation programs. The current lack of awareness of weather insurance among surveyed tobacco farmers emphasizes the need for improved education.

Finally, although not assessed in this study, it is clear that insurance premiums need to reflect market supply and demand in order to attract interest and encourage participation of private banks and agri-business organizations.

This Policy Note has been prepared by Mwiriha Kapondamgaga and Monica Fisher as an output for the Malawi Strategy Support Program. The brief draws on Mwiriha Kapondamgaga's thesis written in fulfillment of her MSc in Agricultural and Applied Economics at University of Malawi's Bunda College of Agriculture in June 2011.The note is intended to promote discussion and has not been peer reviewed. Any opinions stated herein are those of the author(s) and do not necessarily reflect the policies or opinions of IFPRI.

The Malawi Strategy Support Program of the International Food Policy Research Institute (IFPRI) works closely with the government of Malawi and other development partners to provide information relevant for the design and implementation of Malawi's agricultural and rural development strategies.

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