MRR INNOVATION LAB PROJECT IN BRIEF

PROMOTING RESILIENT AGRICULTURAL GROWTH WITH AREA REVENUE INDEX INSURANCE IN GHANA

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Project Partners
The Catholic University of America, Chr. Michelsen Institute, Esoko, Rhema Tidings, University of Alabama, University of Ghana, WorldCover

Development Innovation
Agricultural revenue index insurance

Commodity
Multiple

Targeted Population
Small-scale farmers and agricultural laborers

Country/Location
Northern Ghana

Timeline
2020-2021

Funding
$136,636 (USAID)

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Addressing a full range of agricultural risks, both for producers and the broader community, can strengthen productivity and resilience for rural families. This project is developing an index insurance product that integrates weather and yield data with local price data to create a product that insures total agricultural revenue for small-scale producers. The team is also broadening the market for insurance by expanding it to agricultural labor households who don't have physical crops to insure but whose livelihoods are nonetheless dependent on local agriculture.

The Challenge

Agricultural risk can have devastating effects on rural families in developing countries, making it difficult for them to break the cycle of poverty. Risk can reduce investments in profitable technologies and suppress both demand for and supply of credit. In the wake of a disaster, poor households often are forced to cope by liquidating their productive assets. If they limit meals and other forms of consumption, a disaster can have long-term effects on the nutrition, health and the education of their children.

One solution for this risk is insurance. Over the past 30 years, weather-based index insurance has been heavily marketed and studied throughout the developing world, and numerous studies have documented their positive effects on a range of development outcomes. These include increasing the adoption of advanced production technologies, improving access to credit and helping families to better cope with shocks.[1]

Despite these benefits, this first generation of index insurance contracts has been met with surprisingly low demand largely due high "basis risk," which is the likelihood a contract will to fail to pay out accurately for losses.[2] Despite significant quality improvements in recent years, even the most reliable production-based contracts leave

RESEARCH INNOVATION

Fluctuations in crop and food prices are a significant source of risk with wide-reaching consequences. If the risk is sufficiently high households may consume what they produce to avoid paying high prices.[1] Local risk sharing mechanisms are ineffective at dealing with price risk because it is almost exclusively covariant.

Comprehensive insurance can help protect producers but it leaves out those indirectly affected by agricultural risks, including landless laborers and net consumers. Insurance may exacerbate conditions for those left out of the market if well-insured farmers take on more risky technologies. For instance, agricultural wages in India are more sensitive to local rainfall when rainfall-based index insurance is available to producers.[2]

This project addresses these gaps with a comprehensive set of risk management tools for traditional producers as well as a wider range of community members, including landless laborers and net consumers of staple crops. This could make it possible to address rural poverty and improve resilience across entire communities.

[1] Fafchamps, M. 1992. "Cash Crop Production, Food Price Volatility and Rural Market Integration in the Third World." *American Journal of Agricultural Economics.*
[2] Mobarak, A. M., et al. 2012. "Selling formal insurance to the informally insured." Economic Growth Center Working Paper.

households exposed to other important sources or variation in household revenue such as price risk. Risk in both prices and local production is also critical to rural non-farming families whose incomes depend heavily, albeit indirectly, on local agricultural systems.

Pilot Project

An MRR Innovation Lab research team is building an index insurance product that insures against price variation that affects small-scale farming families as well as families who indirectly rely on stable agricultural prices. In addition to building this new type of agricultural insurance product for rural communities in northern Ghana, the team is evaluating takeup and demand that will determine the feasibility of scaling up the insurance.

Partnerships in Ghana are central to building and offering this novel index insurance product. WorldCover, a public benefit corporation with an existing portfolio of roughly 30,000 policy holders in Ghana, is working with the research team to develop the insurance and make it available on its SMS mobile phone platform. The agricultural technology firm Esoko is providing decentralized agricultural price data for the index from its tracking in the study areas over the past decade.

The contract will follow from one currently in development by the MRR Innovation Lab.[3] It will feature a satellite-based yield or rainfall measure with an audit provision that allows communities to request on-the-ground yield measurements to supplement satellite data. This index will be developed separately for each of the four primary crops in the study region: maize, soybean, cowpeas and groundnuts.

One challenge is reaching both agricultural producers and agricultural laborers. The team is partnering with Rhema Tidings, a local data collection firm, to use the local knowledge of community elites in identifying community members whose livelihoods are tied to agriculture. The team is also piloting strategies for communicating the potential benefits of insurance to the intended populations of interest.

The first round of marketing will take place in December 2020, shortly after the harvest, so households don't face financing constraints when making purchase decisions. This insurance covers the subsequent season from July to December 2021, with payouts conditioned on the December 2021 harvest.

Next Steps

The development impacts of this project will be to introduce more comprehensive insurance products to the rural Ghanaian market, to expand the scope of the market beyond producers to include other vulnerable communities, and to increase overall agricultural output by alleviating the need for farmers to self-insure with inefficient technological choices.

In this initial pilot project, the team is marketing this new insurance product to verify there is the level of demand needed to conduct a broader impact evaluation. This pilot project will provide concrete numbers about takeup and demand after marketing has concluded at the end of the 2020 calendar year.

The team plans to roll out randomized marketing efforts in anticipation of a broader impact evaluation. Sufficient takeup for this pilot will establish a foundation to expand this work into a multi-year evaluation of products that insure against price risk and are available to non-producing agricultural labor households.

[1] Janzen, S. A., et al. 2018. "After the drought: The impact of microinsurance on consumption smoothing and asset protection." *American Journal of Agricultural Economics.*
[2] Clarke, D. 2016. "A Theory of Rational Demand for Index Insurance." *American Economic Journal: Microeconomics.*
[3] Flatnes, J. E., et al. 2019. "Fail-safe index insurance without the cost: a satellite based conditional audit approach." Working Paper.

Development Opportunity: Ghana

29.8 : Population in millions (2018)
13.3% : Poverty rate at $1.90/day, 2011 PPP (2016)
13 : Rural population in millions (2018)
33.9% : Total employment in agriculture (2019)
6.1% : Prevalence of undernourishment (2017)
18.8% : Prevalence of stunting for children under 5 years (2015)

Source: World Bank

Ghana's strong economic growth over the past two decades helped cut the country's poverty rate from 56.5 percent in 1991 to 13.3 percent in 2016. Agriculture is the main source of livelihood for the majority of the country's poorest families and provides a critical source of employment. Ghana is particularly reliant on rain-fed smallholder agriculture as a critical source of domestic food supply, with domestic production of cereals providing 60 percent of national consumption needs.[1]

In northern Ghana, where small-scale producers of staple crops dominate the agricultural system, rural populations and poverty rates are highest. Northern Ghana is also particularly vulnerable to unpredictable rainfall. Like neighboring countries in Africa's Sahel region, northern Ghana is experiencing increasingly erratic rainfall that threatens livelihoods.

[1] Ghana Statistical Service. 2016.

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