Weather index insurance: a market-based approach to managing climate risks

Canadian Coalition on Climate Change & Development

World Vision

Smallholder farmers are becoming increasingly vulnerable to extreme weather patterns but they have fewer resources, including affordable credit, for adaptation. At the same time, micro-finance institutions (MFIs) are often reluctant to provide loans to smallholder farmers as their default rate is generally high due to weather-related crop losses. In cooperation with its partners in the field, World Vision has developed a weather index insurance policy that is bundled with credit products. This insurance protects farmers from unpredictable weather-related events, provides credit to invest in improved technologies, and enables financial institutions to offer loans in higher-risk areas.

Immanuel Mbwambo, a rice farmer from Makindube who has benefitted from the integrated insurance.

Country Context

Agriculture is the engine of economic growth in Tanzania, and is the cornerstone of poverty reduction. It currently represents 85% of exports, employs 80% of the workforce and accounts for 45% of Tanzanian gross national product.[1]

The main challenge facing the agriculture sector in Tanzania is its vulnerability to climate change. The majority of farmers are dependent on rain-fed irrigation to grow crops in already degraded environments; the unpredictable rainfall patterns and increasing temperatures associated with climate change only make the situation more difficult. With insufficient soil and water conservation, limited access to information and a lack of effective natural resource management, agricultural production has declined significantly.

These dynamics are evident in Same District, Kilimanjaro Region, where the vast majority of people are sedentary smallholder farmers, many of whom grow paddy rice in lowland areas fed by rainfall from the South Pare mountain range. Recently, they have been experiencing the effects of decreased and more erratic rainfall patterns which have led to more frequent and acute food shortages.

1 *The World Fact Book,* Central Inteligence Agency. https://www.cia.gov/library/publications/the-world-factbook/geos/tz.html

The Problem

The challenges of climate change in Tanzania are compounded by the lack of access to investment capital for training to meet quality assurance standards. This means that high-value markets for agricultural products remain out of reach of smallholder farmers and they are unable to realize the higher profit margins of the higher market price. Hence, reinvestment in on-farm production technologies is further repressed.

Unless the barriers within agricultural value chains are addressed through systematic and proactive programming, there will be increasing environmental degradation and decreasing community resilience and millions of people in Tanzania will remain at greater risk of reduced food security. The entire value chain needs to be understood and addressed: from inputs, production, processing and marketing. Focusing on improved production alone does not recognize the complex dynamics smallholder farmers must negotiate to build resilience in the agriculture sector and contribute to holistic poverty reduction.

One of the greatest barriers to smallholder farmers entering in or benefiting from agricultural value chains is access to credit. Smallholder subsistence farmers will be unlikely to take risks, as any negative consequences will have serious impacts on their ability to survive. However, traditional lending institutions like microfinance institutions or banks consider it too risky to lend to farmers without collateral. This liquidity constraint prevents smallholder farmers from scaling up to produce more food, participate in value addition and adopt improved agriculture techniques and technology that can reduce environmental degradation.

The Project

One innovative way to reduce the risk for smallholder farmers and lending institutions is to establish insurance policies based on weather index data. As opposed to traditional insurance policies that are paid out based on what is lost, weather index insurance is a predetermined payout based on rainfall thresholds. The thresholds are determined based on seasonal rainfall data from established weather stations in the area. Current data is compared to historical records to determine when a claim is due. Unlike insurance policies in Canada, farmers do not need to submit a claim and have it evaluated; if a threshold is passed, then the policy determines that an automatic payout to farmers is necessary.

Research has shown that where options exist, farmers prefer engaging in insurance programs as their primary means of managing climate risks to their livelihoods – even more so than putting money into savings or other community revolving-fund mechanisms.[2] By incorporating weather index insurance policies within credit and insurance systems, smallholder farmers can access credit to cover the cost of seeds and other inputs at the beginning of the planting season and they can mitigate the impacts of crop failure related to climate and environmental factors. For lending institutions, the risk of default is reduced.

World Vision Tanzania (WVT), in partnership with VisionFund Tanzania, MicroEnsure and Farm Concern, implemented a project to provide smallholder farmers in

2 Norton, Michael. Osgood, Daniel. Madajewicz, Malgosia. Holthaus, Eric. Peterson, Nicole. Gegremichael, Mengesha. Mullally, Conner. The, Tse-Ling. *Evidence of Demand for Index Insurance: Experimental Games and Commercial Transactions in Ethiopia.* 2012.

Same District with support to improve their livelihoods, including through access to weather index insurance. The project supported farmers in three key ways:

- Providing them with a loan and insurance bundle including a mandatory, embedded flood insurance policy.
- Helping them to identify improved paddy seeds and to connect with companies that did not otherwise know a demand existed for these seeds.
- Developing markets so that the farmers could sell their harvested rice as aggregated groups for a higher negotiated price.

By providing credit within a value-chain model, the project systemically built and strengthened vertical and horizontal linkages to create economies of scale, facilitate collective risk sharing, deliver benefits, embed services and skills, and provide market information on horticultural and cereal crops for value chain players.

On the Ground

The project started in 2011 with 5095 farmers participating. The participating farmers were organized into producer commercial groups. Many of these groups were established on pre-existing savings and credit groups that WVT had already trained. These groups are often made up of women, who have played a critical role in leadership in the project.

In the first year, among the participating farmers, 537 accessed the new insured loans. Those who did not receive these loans were not able to access improved seeds, appropriate inputs or able to increase their land cropping area. The relatively low access rate during the first year of the project was likely due to low awareness of the benefits of bundled loans and insurance products, which were relatively new to the community. Since then, interest in both products has increased.

Impacts/Results

Previously, farmers in the Same District were able to harvest on average about fifteen 50 kg bags of rice per acre. As a result of sensitizing farmers about the value of working in producer groups, aggregating commodities for scale, and quality assurance, the 5095 farmers participating in the project realized yield increases of 37% and price increases of 76%, resulting in a net income increase of 142%. Of the 537 farmers that received credit and insurance they saw an additional increase over and above other producers by 62% in production. Additionally these same farmers were able to increase their plot sizes by 79%.

In December 2011, a major flooding event occurred in Same District, affecting 283 of the farmers participating in the loan and insurance program, wiping out the paddy seeds they had planted. These farmers received a payout on their flood insurance policy and they were able to replant their seeds in time to yield a successful harvest. As a result of the insurance payout, these farmers were comparatively better off than others affected by the flooding, who were only able to replant small areas of paddy after the flood subsided.

Based on this evidence of the benefits of the loan and insurance program, the number of farmers participating increased to 700 in the following season. This number is expected to increase to 1000 farmers in the upcoming season.

PROJECT PARTNERS

World Vision Tanzania (WVT) was responsible for coordinating the project. They have strong relationships with the communities. As such it was well positioned to mobilize farmers into groups, coordinate with the Tanzanian government and other partners to access extension services, access local warehouse facilities and arrange for transportation for the produce to regional markets.

VisionFund Tanzania, a World Vision International (WVI)-owned micro-finance organization that supported this effort by providing loans to farmers to purchase quality seeds. It reduced the risk of the loans by bundling the insurance with the loans.

MicroEnsure, a private insurance company that developed the weather index insurance product by setting up weather stations and collecting data. As the underwriter it dealt with the claims after the flooding events.

Farm Concern, an NGO that works with smallholder farmers through market-based solution surveyed and analyzed the market and identified the appropriate seeds and buyers. It facilitated the development of the local groups through various types of training related to planting, harvesting and quality control.

LESSONS LEARNED

This project provides a good example of how tailored credit and insurance services can improve the ability of farmers to face climate-related shocks and recover more effectively. In this case, farmers who had paid into an insurance policy and were affected by the extreme flooding event were able to recover and replant again. Without this insurance coverage, the farmers would have lost all their seeds, would have not been able to replant, and would have required emergency food distributions.

Several important lessons emerge from the project's experience to date:

The importance of reliable and appropriate weather data for weather index insurance. Collection of weather data has been a big obstacle for the project. The target region had a variety of micro-climates due to its proximity to a nearby mountain range. Often data collection done at the top of the range would not accurately reflect the amount of rainfall at the bottom of the watershed. This created challenges in determining payouts for farmers. This highlights the need to expand the body of satellite data available for weather index insurance policies and to triangulate this data with local weather station data.

The need for education and awareness raising with farmers on the value of insurance policies in reducing risk to livelihoods. Insurance products are a relatively new concept in Tanzania, and farmers do not always understand the benefit of paying for something that does not provide an immediate return. In many western countries, buying insurance is seen as a natural (or even legislated) way to reduce risk; however, this concept is still new in Tanzania. A related challenge was that the farmers were initially more interested in drought insurance than flood insurance; however, the costs of collecting and analyzing data from many micro-climates to support drought insurance proved too costly for this initial phase of the project. The consortium will re-evaluate this issue in a later phase.

The need to focus on the entire value chain and identify barriers that smallholders face in production of food. Increasing production is important for smallholders to achieve better food security, but the ability to earn monetary resources is critical for farmers to purchase capital assets, such as irrigation systems or drought-tolerant seeds, that help reduce the risk caused by more variable rainfall patterns. Smallholder farmers need the ability to access credit to make the upfront investment necessary to reach high value markets. Credit is rarely accessible due to the perceived risks by credit or bank agencies and this in the end can be mitigated by solutions like weather based index insurance.

A REFLECTION BY A PROJECT PARTICIPANT

Mwantumu Ally lives in an area that is vulnerable to floods and was one of the farmers who benefited from the weather index insurance. She is a divorced mother of five children, all of whom are in school.

Mwantumu took the insurance-embedded loan from Vision Fund Tanzania feeling confident that she could upgrade her status from being a small-scale paddy rice grower to a large and well-established rice farmer.

"Within just a short period of time, we are already seeing the differences," she comments. When her farmland was severely flooded, she managed to replant her crops using compensation money from the insurance. "If it was not for the insurance, I could have not gone back to the farm after the flooding that affected my entire farm plot," she says.

Mwantuma harvested 30 bags per acre and sold at an unprecedented price of 85,000 Tanzanian shillings (approximately $50 Cdn) per 50 kg bag. Mwantumu is also celebrating the fact that she is free from "middle men" who were making her community poorer.

Her eldest child Ruth Ally, a student at secondary school, agrees: *"I have seen the benefits of my mother joining* [the project] *because nowadays we have a better diet and my school fees were paid on time."*

Credit: Case study compiled by Josh Folkema, Environment & Climate Change Technical Specialist, World Vision Canada