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Risk management in agriculture

Ongoing studies with coffee farmers in Costa Rica affected by coffee leaf rust

MARÍA ANGÉLICA NARANJO– SEPTEMBER, 2015

The Economics and Environment for Development Research Program (EEfD) at CATIE is leading a series of studies on decision-making under risk. We address the issue of adaptation to climate change from the perspective of how farmers' attitudes towards risk, affect the adoption of different adaptation strategies, including crop insurance demand, and in the light of the recent coffee rust epidemic in Central America.

Farmers in rural areas of developing countries face risky decisions every day (e.g. technology adoption, weather variability). These decisions have a significant effect on wealth and is a main cause of low yields, slow growth and persistent poverty (Carter et al., 2014). In a context where more extreme weather events are predicted and technology to address threats is available, why some farmers are more prone to take action than others?

Farmers anticipate that uninsured shocks will strike and adjust their behavior to reduce the expected consequences of shocks (Rosenzweig and Binswanger, 1993). Farmers may choose a preventive management and reduce the risk, or react after being affected to cope with the consequences of shocks.

Preventive actions involve reducing the risk, risk avoidance, risk transfer and risk retention. For example, reducing the risk requires investment in resilience (i.e. producer's ability to overcome the shock). Farmers avoid risks by investing in activities or practices with less risk but usually with low yields. Risk transfer can be formal (e.g. crop insurance) and informal (e.g. help from family and friends). Finally, risk retention through precautionary savings and ensuring access to credit (Carter et al., 2014).

After the shock occurred, households react by reducing consumption and/or selling assets with high social costs. Other adjustments are financial measures such as dis-saving and borrowing, which are also very costly. Social assistance with cash grants and productive inputs are commonly used by governments to help families cope with crisis in the short term, but is not a lasting solution.

Evidence showed that many of these strategies are insufficient to cope with unexpected losses in production. Formal instruments such as crop insurance are available, but in Costa Rica and other developing countries, this are expensive and difficult to implement due to contract design, lack of information, moral hazard and high transaction costs.

RESEARCH BRIEF

Risk management in agriculture: Ongoing studies with coffee farmers in Costa Rica affected by coffee rust

Coffee rust in Central America

In 2012, coffee rust affected Central America, with serious consequences for production and therefore the income of farmers. Biological hazards, such as the rust, are always present in coffee areas, and farmers have managed to control the disease. However, the interaction of certain factors cause the leaf rust to become an epidemic. These factors include climatic factors, like the increased temperature and humidity, which modifies the life cycle of the fungus causing it to expand rapidly (Avelino et al., 2015). Another factor is economic, for example, low coffee prices and high input costs, lead producers to reduce investment in preventive adaptation practices.

Source. SCAA Symposium archives

Evidence shows that it is possible to reduce the risk by maintain prevention management practices that reduce their vulnerability. Studies show that farmers after a regular program of preventive management with fertilizer and fungicide applications reduced the risk of being affected by the disease. Then, after the coffee is affected, the timely application of fungicide and fertilizer is key to control the expansion and renovate the lost leafs (Avelino et al., 2015).

In 2014, EEfD conducted a survey with coffee farmers in Costa Rica affected by the coffee leaf rust in to coffee areas: Los Santos and Perez Zeledon. The data obtained from surveys, applied to 294 farmers, show that the epidemic of 2012 affected 81% of the farmers in our sample, which suffered a significant drop in their production. The effects of the coffee rust were felt more strongly in Perez Zeledon, where the coffee rust (see Figure 1) did not affect only 5% of the sample.

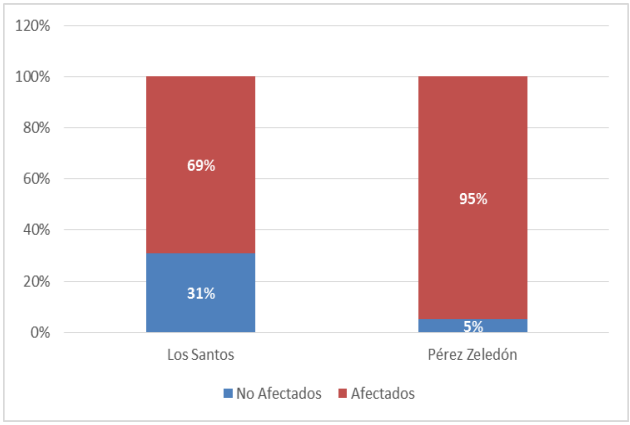

Figure 1. Percentage of farmers affected by rust

Farmers were also asked about credit, savings and government aid, in order to determine which measures were taken at a household level to cope with the shock. From the producers affected by rust in our sample, 38% (91 producers) applied for a loan specifically to bear the consequences caused by the epidemic; 60% of these 91 producers obtained such credit. 19% of the households had savings that they used to cope with the effects of the rust. 48% of the sample received in-kind assistance from the government (i.e. agrochemicals), while 26% farmers and their families received financial assistance, which consisted of about $200 per month.

Regarding insurance, there is a significant lack of knowledge about crop insurance. 83% of the farmers never heard of this insurance and the remaining 17% only half knew that coffee was an insurable crop in Costa Rica. It should be noted that none of the 294 farmers surveyed purchased this insurance as a risk management strategy.

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Ongoing studies at EEfD

EEfD is leading a group of behavioral studies, to examine the impact of farmers' attitudes towards risk on the choice of adaptation strategies. Preliminary results indicate that risk aversion could be determining the used of preventive application of fertilizers and the use of pesticides as a risk coping strategy to the coffee leaf rust.

This year, we are conducting a study to explore the demand for agricultural credit, when the credit requires the purchase of crop insurance. Access to credit, gives the farmer resources to invest and, by combining credit with insurance, it covers from the risk of losing the harvest and secure the payment of the loan.

A better understanding of individuals' response to extreme weather events is fundamental for designing adaptation strategies in developing countries. Efficient adaptation should be aimed at reducing private and public costs. Our outcomes are an important input for the design of policies that reduce the adverse effects caused by a changing climate in Costa Rica and the rest of Central America.

ABOUT THIS BRIEF

This summary is based on the research projects of the Research Program on Development, Economy and Environment (EEfD) CATIE. For more information visit: http://www.efdinitiative.org/central-america/

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