BASIS
Assets and Market Access Collaborative Research Support Program

AMA CRSP

Annual Report

October 2009-September 2010

BASIS AMA CRSP

AMA CRSP

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December 2010

This publication was made possible in part through support provided by the
US Agency for International Development (USAID)
under the terms of Grant No. EDH-A-00-06-00003-00,
and by funding support from the AMA Collaborative Research Support Program
and the **Department of Agricultural and Applied Economics,**
University of Wisconsin-Madison, USA.

Acknowledgements
Our thanks go to all who participate in the AMA CRSP for helping make this
document possible. Comments on this report and AMA CRSP work are encouraged.
Please visit the website for more information about the projects, contact
information, and upcoming events: http://www.basis.wisc.edu

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THE BASIS APPROACH TO DEVELOPMENT: TARGETING THE NEEDS OF THE RURAL POOR

THE DIRECTOR'S REVIEW OF THE BASIS AMA CRSP

THE MAY 2010 RELEASE of the *Feed the Future Guide* signaled the commitment of USAID and the US Government to accelerate inclusive agricultural sector growth. (The guide is available online: http://www.feedthefuture.gov/guide.html.) This goal is in keeping with the strong body of evidence that agricultural growth, especially when inclusive or broadly-based, helps reduce poverty. Therefore, meeting Feed the Future poverty reduction and hunger elimination targets requires strategies that focus on inclusive agricultural growth.

To date, sound mechanisms to involve low-wealth rural households in the growth process have proven elusive. Therefore, AMA CRSP's new and ongoing research and pilot projects speak directly to the need for innovations that will:

- provide sound and affordable risk management services to small-scale producers and their communities
- increase and sustain smallholder access to savings, affordable inputs and improved technologies
- improve small farmer access to business development and financial services.

Let's look more closely at AMA work in these areas.

Seeking to improve wellbeing and economic growth. AMA works closely with those most affected by development policies: rural agriculturalists like these farmers in Ethiopia learning about index-based livestock insurance.

Risk management

In 2010, AMA and USAID convened a meeting in Rome of leading thinkers on rural risk and risk management, which helped launch the I4 Index Insurance Innovation Initiative. The meeting resulted in a clear set of priorities and promising directions for I4 pilot schemes to build risk management instruments that are sustainably implemented by the private sector and meet the needs of small-scale farming and pastoral communities. These priorities were incorporated into a call for proposals, and by mid-2010 five new index insurance projects were selected and funded, joining three projects in this area already underway with AMA sponsorship.

By employing rigorous impact evaluation and research methods on index insurance products, these exciting new pilot projects will help rural families link to new economic growth opportunities.

In Ethiopia, for example, an I4 pilot uses weather-based index insurance to tackle the interlocking market failures that currently inhibit rural development and result in low fertilizer use and low credit uptake. The project will pilot a form of insured credit to local cooperatives. In years of poor harvest the insurance will pay back the annual investment required for farming, thus providing a comprehensive risk management tool for Ethiopian farmers. The provision of insured credit should crowd in investment and inform best practices from other I4 projects that also link credit and insurance.

Climate change is another force that threatens rural livelihoods in many parts of Africa. While insurance

may seem like an obvious solution to the threat of increased climatic instability, the insurance industry is logically wary of issuing contracts in areas with shifting, unknown levels of risk. In Ethiopia, a second I4 pilot project is trying to break through this problem by designing an index-based livestock insurance that explicitly takes into account the threats and opportunities presented by climate change. Specifically, this project draws on the Intergovernmental Panel on Climate Change (IPCC) predictions of climate change and associated rangeland biomass dynamics in order to explore dynamic pricing that fairly accounts for expected climate change impacts. In addition, this project will explore the potential for conditional insurance transfer programs that link livestock insurance to the adoption of strategies designed to minimize the deleterious consequences of climate change.

In Mali, an I4 pilot will design a district-level area-based yield index insurance product for cotton producers. In Mali, cotton producers are organized into cooperatives and are jointly liable for investment loans that cover seed and fertilizer inputs. By targeting cooperative groups that are vulnerable to loan default from variable weather, this pilot will provide insight into both cooperative risk management strategies and joint liability. Through comparisons with other I4 activities focusing on group-based contracts or credit linkages, this project will identify best practices that can be applied to similar insurance products in other regional contexts.

Importantly, these three pilots, along with the two others selected by I4, build on lessons from ongoing I4 projects. The Mali cotton farmer pilot, for example, is developing a new, innovative dual strike point contract, the inspiration for which emerged directly from conversations with Peruvian cotton farmers involved in the area-based yield insurance project for Peruvian coastal agriculture, which has now entered its third year. (See page 31 for the chapter on the Peru project.)

Similarly, the Ethiopia index-based livestock insurance pilot draws on lessons from a highly innovative venture underway in northern Kenya and now entering its second year. This latter project has generated a wealth of ideas and materials useful for helping new projects tackle the difficult task of educating small-scale farmers about how index insurance works and what its limitations are. (See page 25 for the chapter on this project.)

This educational aspect is of critical importance. Several AMA projects show that subsidies can encourage take up of novel insurance products, such as health insurance in Cambodia (see page 9) and weather insurance in India (see page 19). Yet, while subsidies, or improved efficiencies in pricing, may be necessary to facilitate dramatic increases in risk coverage, providing *financial education* may prove to be the most important ingredient for getting insurance into the hands of the poor. In India, for example, take up of weather insurance has increased over the three years of the project, as the project has provided financial education to farmers. In spite of the complexity of these insurance products, AMA work shows that financial education can be as important as subsidies in increasing take up by families.

The launch of the new pilot projects and the ongoing AMA work on risk management already has yielded exciting preliminary results; the work of the next few years will reveal the way in which these novel forms of risk management can provide productive social protection.

Increased savings, affordable inputs and improved technologies

World food prices returned to record levels in late 2010, reviving concerns about impoverishment, hunger and social unrest in the developing world. Being a net food importer, Sub-Saharan Africa is severely affected, in particular the 320 million inhabitants living on less than a dollar a day, with food representing the bulk of their consumption. Yet, Sub-Saharan Africa has substantial agricultural potential that remains untapped because of farmers' limited use of existing modern agricultural technologies.

One effort to tap this potential has been the provision of seed-fertilizer subsidies to small-scale farmers. While adopted on an increasingly wide scale across the continent, there has been relatively little effort to evaluate the effectiveness of subsidies in either the short or long run. A new AMA study attempted to fill these lacunae by estimating the impacts of Malawi's 2009 Farm Input Subsidy Program (FISP) on fertilizer use and maize yields (see page 89). The findings show positive and statistically significant correlations between participation in the FISP and intensity of fertilizer use. Fertilizer use is higher among households that plant improved maize varieties than among those that plant traditional varieties. FISP was associated with an increase in

maize availability of approximately 250kg per household in the AMA sample.

While the Malawi study provides needed evidence about the short-term impact of small farm technology subsidies, do these impacts persist once subsidies are removed? A second AMA project is examining this longer-term question, asking if farmer practices change fundamentally after subsidy programs or change only in direct reaction to the availability of subsidies and fade after these are withdrawn. If subsidy impacts are to persist, then clearly farmers need to be able to replace the value of the subsidies with their own savings (or other sources of capital).

This second AMA pilot project distributed vouchers for fertilizer in a randomized fashion to a sample of farmers in Mozambique (see page 53). In partnership with a local financial institution, the researchers then randomized offers of a matched savings account to farmers. Designed to get farmers into the habit of both saving and interacting with formal financial institutions, the matched savings program pays a 50% match to farmers who meet a savings target tied to the amount of funds needed to finance improved agricultural technologies without subsidies. After an initial small-scale pilot phase (in which a group matched savings account was piloted and rejected), this new program is currently in the field.

As illustrated by this Mozambique project, facilitating savings can be a key to the type of long-run growth for the small farm sector that is central to the Feed the Future initiative. Another AMA project on savings incentives provides further lessons on strategies whereby offering a commitment savings product alongside a loan can allow an individual who would otherwise borrow indefinitely to both increase his or her savings and repay the loan. In an experiment with the largest public bank in Guatemala, AMA analyzed the savings response of microfinance borrowers who were given the opportunity to contribute to a savings account at the time they made their regular monthly loan payment (see page 47). The bank engaged in a promotional campaign to induce its microfinance clients to open a savings account. Clients were then offered one of three options: a savings account with no commitment to save (the control group), a commitment savings account where each time clients paid their loan they committed to save an amount they themselves had decided upon, and a commitment savings account where the default level of saving was set at 10% of the loan payment.

The results on product acceptance rates and savings behavior were striking. The savings promotion was powerful in inducing clients to open a savings account, with roughly 40% in both the control group and the commitment savings group that self-determined the level of savings choosing to open a savings account. Nearly 80% of those in the savings group that had a 10% default level of savings opened an account. For all savers, a faster rate of savings accumulation corresponded to a faster rate of capital repayment on the loan and a weakly lower incidence of repayment problems, indicating that savings and loan repayment were complementary. These AMA treatments represent scalable commitment savings products, with results showing that borrowers who recognize that they lack the self-discipline to save and are willing to bind themselves would experience welfare benefits that could possibly move them from a debt-driven to a savings-driven investment path.

Access to business development and financial services

Low levels of education and lack of access to credit—constraints such as these are typical of rural areas in most developing countries, particularly in the agricultural sector. Implementing development strategies to eliminate or ease these constraints can help farmers realize a greater productive potential.

A Nicaraguan entity, the Millennium Challenge Account (MCA), was established to implement a program that offered farmers rural business development services, including technical and financial assistance and improved market information and linkages. AMA was brought in to evaluate the direct impacts of this rural business development project (see page 59). Preliminary results show that the project does have significant impact on the economic wellbeing of many rural households, but it does not work for everyone. Variables such as credit constraints and tenure conditions could explain some of this impact heterogeneity.

The analysis shows that the project did not directly benefit many households below the mid-point of the rural income distribution. How far down the distribution a technology and business skill transfer project can go is an important and always difficult question. The results so far obtained from this study show that the effect of the program has no relation to the initial living standard of a household. Households close to the eligibility floor could obtain the same absolute benefit from the project as easily as

households with a higher endowment of assets. This finding suggests that this MCA project, as well as similar projects, might consider reaching further down the wealth distribution.

Poor, rural farmers are often left out of the market altogether. A study in Peru measured improvements to overall farmer welfare based on their participation in a contract with a firm (see page 43). The findings show that contract farming arrangements can favor the inclusion of smallholders and link them to dynamic markets. The farmers in the study received more inputs and financial assistance from the firm with which they contracted. This led to building a long-term relationship with the firm and receiving higher prices for production.

Initial findings from an AMA project in Ghana found that providing capital and insurance to farmers made a difference in their practices, investments and behaviors (see page 71). Farmers with capital and insurance spent much more on fertilizer compared to the control group, and farmers also increased revenue from bagged crops. These farmers cultivated more acres compared to the control group and increased the proportion of hired labor.

Continued opportunities to make a difference

As illustrated above, AMA has demonstrated impact in critical areas that can lead to agricultural growth and economic opportunities for the rural poor in developing countries: risk management, savings, inputs and technologies, and business development and financial services.

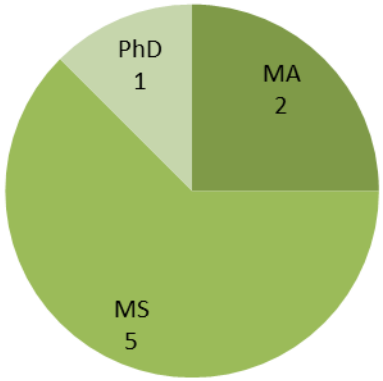
AMA has made strides in other areas. In Nicaragua, a study of an ongoing conditional cash transfer program found significant effects on cognitive outcomes, especially language. These impacts were in evidence two years after the program ended. The cash transfer program increased intake of nutrient-rich foods, early stimulation, and use of preventive health care—all of which have been identified as risk factors for development in early childhood. Households increased expenditures on these inputs more than can be accounted for by the increases in cash income only, further suggesting that the program changed behavior on the part of the parents. The findings suggest that gains in early childhood development outcomes should be taken into account when assessing the benefits of cash transfer programs in developing countries.

AMA encourages innovations, as evidenced by a project in India that uses mobile phone technology to disseminate futures prices to farmers. Previously, farmers had to travel to price boards to check futures prices; now mobile technology makes it possible to cater financial information to individual farmers and provides insight into how information spreads among farmers. Mobile phones also prove to be a benefit to research as they can lower the cost of conducting farmer surveys and enable more frequent surveys; this in turn helps paint a more nuanced picture of how farmers make decisions on planting crops and what price expectations they have.

Many of the AMA projects and their impacts were summarized above. The remainder of this report includes detailed reporting of the accomplishments of these and every other current AMA project. We invite you to visit our website (www.basis.wisc.edu) for additional information about these activities.

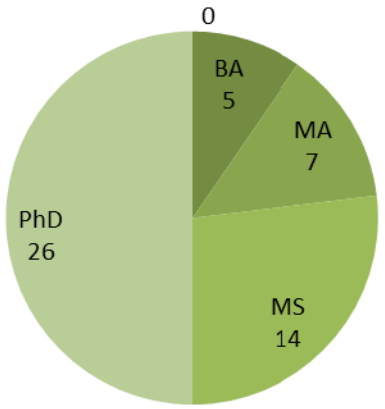
AMA CRSP TRAINING

Degrees Received

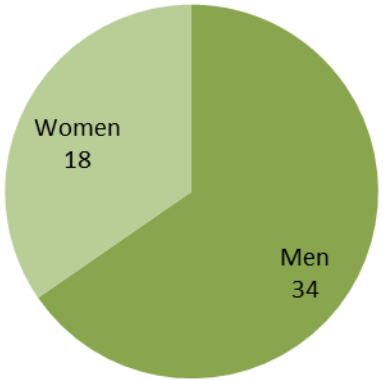


Students Trained

Total students trained FY10: 52

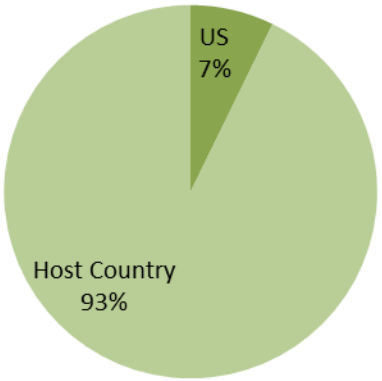


Trainees by Gender



Short Term Trainees

Total number of short-term trainees FY10: 566



AMA CRSP PARTNERSHIPS

AMA CRSP U.S. Based Research Partners

Cornell University

Duke University

Georgia State University

Georgia Institute of Technology

Harvard University

International Food Policy Research Institute

Johns Hopkins University

Massachusetts Institute of Technology

Michigan State University

Purdue University

Syracuse University

University of California-Berkeley

University of California-Davis

University of California-Riverside

University of California-San Diego

University of Colorado

University of Michigan

University of San Francisco

University of Wisconsin - Madison

World Bank

Yale University

AMA CRSP International Research Partners

BASIX Consulting and Training Services

Center for International Forestry Research (CIFOR)

Central American University

Centro de Investigación y Acción Educativa Social (CIASES)

Domrei Consulting

Food and Agriculture Organization

Grupo de Analisis para el Desarrollo

Indian Institute of Management-Calcutta

Institute of Statistical, Social and Economic Research (ISSER)

Instituto de Estudios Peruanos

International Food Policy Research Institute (IFPRI)

International Livestock Research Institute (ILRI)

Makerere University

Norwegian University of Life Sciences

Oxford University

Padjadjaran University

Royal University of Phnom Penh

Universidad Rafael Landivar

University of Athens

University of Ghana-Legon

University of Liberia

University of Malawi

University of Namur

AMA RESEARCH THEME:

INSURANCE AND RISK MANAGEMENT

ALL OF US ARE SUBJECT TO DIFFERENT TYPES OF RISK, both personal, such as family illness, or community wide, such as natural disaster. Risk is especially prevalent in agriculture, where farming households are subject to many health risks and where a poor rainy season may destroy a harvest. The provision of agricultural finance is very low due to the high risk involved, and it is particularly difficult for smaller producers to get access to loans. Even if a loan were available, families with access to credit markets might be reluctant to take out a loan for fear of losing collateral in case they are unable to re-pay. Yet, if an expansion of access to finance is combined with the provision of insurance and other financial products and services, then the risks to both borrowers and lenders can be reduced, and participation in financial markets will increase.

In the projects and pilots described in this section, AMA researchers look at the impact of health insurance products to protect borrowers in the case of illness, and the creation of innovative new types of crop insurance to increase the availability of agricultural finance. With a greater ability both to manage risk and engage in new production strategies, farmers can realize a higher income trajectory and improve their long-term wellbeing.

AMA PROJECTS

- I4 Index Insurance Innovation Initiative
- Micro Health Insurance in Rural Cambodia: An Evaluation of the Impact on the Stabilization of Incomes and Enhancement of Agricultural Productivity and Asset Accumulation
- Understanding the Impact of Idiosyncratic Shocks on Farm Productivity and Household Asset Building and Protection in Ethiopia, Ghana and Bangladesh
- Weather Insurance, Price Information and Hedging: Financial Initiatives to Help the Poor Manage Agricultural Risk (India)
- PILOT: A Productive Safety Net for Northern Kenya's Arid and Semi-Arid Lands: The HSNP+ Program
- PILOT: Area Based Yield Insurance for Peruvian Coastal Agriculture

AMA BASIS BRIEFS

BASIS Brief no. 2010-09. Marketing Complex Financial Products in Emerging Markets: Evidence from Rainfall Insurance in India, by Sarthak Gaurav, Shawn Cole and Jeremy Tobacman. October 2010.

BASIS Brief no. 2008-08. Altering Poverty Dynamics with Index Insurance: Northern Kenya's HSNP+, by Christopher B. Barrett, Michael R. Carter, Sommarat Chantarat, John McPeak, and Andrew Mude. November 2008.

BASIS Brief no. 2008-07. Insuring the Never before Insured: Explaining Index Insurance through Financial Education Games, by Michael R. Carter, Christopher B. Barrett, Stephen Boucher, Sommarat Chantarat, Francisco Galarza, John McPeak, Andrew Mude and Carolina Trivelli. October 2008. Available in Spanish.

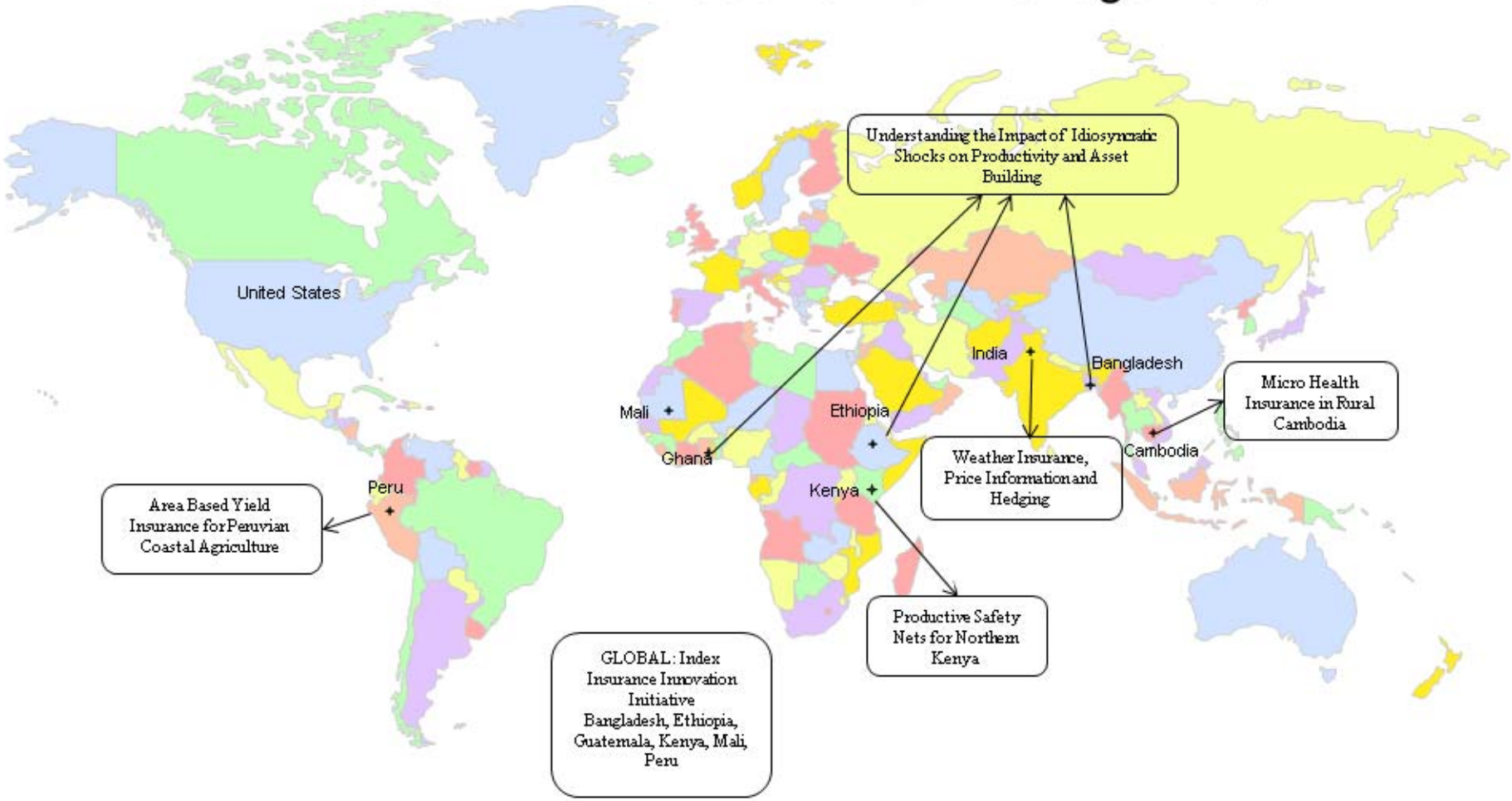
BASIS Brief no. 2008-01. Weather Insurance, Price Information, and Hedging: Helping the Poor Manage Risk, by Shawn Cole, Raghabendra Chattopadhyay, Stefan Hunt, Jeremy Tobacman, and Petia Topalova. January 2008.

BASIS Brief no. 2007-05. Insuring Health: Testing the Effectiveness of Micro-health Insurance to Promote Economic Wellbeing for the Poor, by David I. Levine, Nhong Hema, and Ian Ramage. July 2007.

BASIS Brief no. 2007-03. Local Risk Management: Protecting Household Asset Building and Farm Productivity from Idiosyncratic Shocks, by Christopher B. Barrett, Ernest Aryeetey, Agnes Quisumbing, Akhter Ahmed, John Hoddinott, Felix Naschold, Jacqueline Vanderpuye-Orgle and Tassew Woldehanna. July 2007.

BASIS Brief No. 46. Can Insurance Unlock Agricultural Credit and Promote Economic Growth? by Carolina Trivelli, Michael Carter, Francisco Galarza, Alvaro Tarazona, and Johanna Yancari. May 2006.

AMA CRSP: Insurance and Risk Management



I4 INDEX INSURANCE INNOVATION INITIATIVE

Collaborating Partners

International Labour Organization

Japan International Cooperation Agency Research Institute

Research Collaborators

BASIX Consulting and Training Services Ltd.: Rajeev Kumar Gupta

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Duke University: Marc Bellemare

Food and Agriculture Organization of the United Nations: Shukri Ahmed, René Gommes

International Food Policy Research Institute: Alemayeho Seyoum Taffesse, Ruth Vargas Hill

International Livestock Research Institute: Andrew Mude

Landivar University: Tomas Rosada

Oxford University: Stefan Dercon

University of Athens: Alexander Sarris

University of California, Berkeley: Alain de Janvry, Elisabeth Sadoulet

University of California, San Diego: Craig McIntosh

University of Colorado: Carlos Martins-Filho

University of Namur: Catherine Guirkinger

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IFMR Centre for Insurance and Risk Management: Rupalee Ruchismita

International Labour Organization: Michal Matul

Japan International Cooperation Agency Research Institute: Megumi Muto

Katholieke Universiteit Leuven: Jo Swinnen

MicroEnsure: Shadreck Mapfuma

Nyala Insurance: Eyob Meherette

Oxfam: Marjorie Victor

United Nations University: Luc Christiaensen

University of California, Davis: Steve Boucher, Travis Lybbert

University of Michigan: Dean Yang

University of Montana: Vincent Smith

University of Namur: Jean-Philippe Platteau

World Bank: Xavier Giné

http://i4.ucdavis.edu

Outputs

Carter, M. R., C.B. Barrett, S. Boucher, S. Chantarat, F. Galarza, J. McPeak, A.G. Mude, and C. Trivelli. 2008. "Insuring the never before insured: Explaining index insurance through financial education games."

De Bock, O., M.R. Carter, C. Guirkinger, R. Laajaj. 2010. "Etude de faisabilité : Quels mécanismes de micro-assurance privilégier pour les producteurs de coton au Mali?" Centre de Recherche en Economie du Développement, Universitaires Notre-Dame de la Paix, Namur, Belgium.

(English version "Feasibility Study: Which micro-insurance mechanisms are most beneficial to cotton growers in Mali" also available)

Lybbert, T.J., F. Galarza, J. McPeak, C.B. Barrett, S. Boucher, M.R. Carter, S. Chantarat, A. Fadlaoui, and A.G. Mude. 2009. "Dynamic Field Experiments in Development Economics: Risk Valuation in Morocco, Kenya and Peru."

McPeak, J., S. Chantarat, A.G. Mude. 2010. "Explaining Index Based Livestock Insurance to Pastoralists."

Mude, A.G. 2010 "Development of the World's First Insurance for African Pastoralist Herders" Video can be viewed at http://blip.tv/file/3757148

ACTIVITIES

Housed at the University of California, Davis, the I4 Index Insurance Innovation Initiative is a response to the evidence that uninsured risk can create and sustain poverty and food insecurity, especially among low-wealth agricultural and pastoralist households. Risk can cause people to shy away from high-return activities or pursue defensive savings strategies that cut off sustained accumulation of productive assets. Risk also inhibits the development of rural financial market, which reinforces risk's negative impacts.

Finding ways to deal with risk and reduce poverty has long been a goal of development policy. While there is ample theory to show that index insurance can alter poverty dynamics, there is still much to learn about its effectiveness in practice. To rigorously test the hypothesis that by removing correlated risk from smallholder agricultural and pastoral systems we can reduce poverty and deepen financial markets in agricultural areas, the I4 team is designing and implementing a new generation of livelihood-optimized index insurance contracts. Potential impacts include improving technology uptake by farmers, thus increasing their incomes, attracting lenders into rural markets, and reversing the dynamics that create destitute families, reducing the massive costs of direct aid programs. While index insurance would seem to be an ideal instrument for transferring risk from smallholder households (as it promises low transactions costs and minimal problems of adverse selection and moral hazard), its viability and poverty reduction impacts have yet to be demonstrated. The goal of the I4 is to discover whether, when and how these impacts can be realized and sustained.

The costs of risk can be devastating

Risk makes people poor. A recent study suggests that a significant portion of the smallholders who dominate Peruvian coastal agriculture refrain from borrowing for fear of putting their land at risk as collateral. In 2008, a pilot index insurance program in the valley of Pisco, Peru was launched. By offering cotton farmers protection against default in years in which average valley yields fall below 85% of the historic average, the pilot studies whether insurance increases credit supply by reducing lenders' risk, while encouraging farmers to invest in higher-yield activities and technology.

Risk keeps people poor. In the pastoral regions of northern Kenya, risk creates a poverty trap, and each season more people collapse into indigence and food-aid dependence. In the region, a Productive Safety Net (PSN) will rely on an index insurance mechanism intended to prevent households falling into poverty, while allowing them to accumulate assets. This should help improve finance markets, which can spur investment and growth.

*See **BASIS Brief 2008-07**, available at www.basis.wisc.edu, for information about the Peru and Kenya pilot programs.*

Current ongoing projects

I4 has three projects already underway. These are:

- Area Based Yield Insurance for Peruvian Coastal Agriculture (see separate chapter in this annual report)
- A Productive Safety Net for Northern Kenya's Arid and Semi-Arid Lands: HSNP+ Program (see separate chapter in this annual report)
- Optimal Design of Index Insurance Contracts

We have since added new pilots projects. In January 2010, I4 hosted a scientific meeting that brought together researchers, policy-makers and the private sector. The meeting was held in collaboration with the International Labour Organization (ILO) and the Food and Agricultural Organization of the United Nations (FAO), in addition to Oxfam. The meeting focused on the role of risk and insurance in poverty reduction, risk and expansion of rural credit, areas for future research and the need for impact evaluation research.

The meeting identified the need to expand pilot projects to diverse agro-ecological, economic and social environments in Africa, Asia and Latin America. In March 2010, I4 issued a request for proposals to

establish the feasibility of long-term pilot activities that design, market and evaluate innovative index insurance contracts targeted at improving the lives and livelihoods of small-scale agricultural or pastoral households. I4 received more than 40 submissions of intent and 29 proposals for seed grants. Projects were evaluated based on their ability to achieve the following.

Growth opportunities. Pilots operate in locations where insurance can be interlinked with growth opportunities. Insurance is valuable in helping families maintain their living standards in the face of income fluctuations, yet its greatest value—and perhaps the key to its sustainability—may arise when it can be linked with new economic opportunities. When insurance helps a farmer access credit that has been unavailable in the past, or adopt new technologies that increase yields, then this added value allows farmers to both protect consumption and enhance their investment in income and assets.

Rigorous impact evaluation and research methods. Each pilot embeds a rigorous research agenda into the design and offering of the index insurance product. The research plan must include a strategy to effectively identify the impact of the insurance on credit market participation, farmer adoption of technology, and household income and wealth.

Informed uptake. Each pilot includes an appropriate educational and outreach strategy to ensure that farmers in the pilot region fully understand index insurance and what the product both can and cannot offer farmers. These efforts will build on financial education games developed by BASIS that help create demand for index insurance by improving farmer knowledge of and trust in the product.

Sustainability. The development of the insurance contract and the selection of local partners must have the goal of developing the insurance market so that it remains viable and grows after the program is completed.

Local scale-up and dissemination: In order to maximize impact in the host country, each pilot will be expected to clearly communicate both the methodology of product design and research results to the local insurance industry. In addition, the pilot will promote technology transfer and enhance local technical capacity for the design, implementation, and supervision of index insurance products. Finally, the pilots must demonstrate collaboration with private sector partners (insurance companies and microfinance institutions) to promote the scaling up of the index insurance market beyond the region of pilot implementation.

The new seed projects are as follows.

- Index-Based Livestock Insurance: Adaptation and Innovations for Ethiopia. Christopher Barrett: Cornell University. *Satellite-based index for insuring livestock for pastoralists in Ethiopia*.

This project builds on lessons learned from a highly innovative pilot venture underway in northern Kenya, adapting that pilot to the Ethiopian context. It will design and introduce new group-based and/or credit-linked IBLI products, aimed to crowd-in productive investment opportunities. The IBLI product is overlaid with a government-run safety net program (the Productive Safety Net Program, PSNP) to identify potential complementarities or tradeoffs between these different instruments for addressing poverty and shocks. Because of the similarity of the IBLI product with the existing Kenya pilot, this project will allow cross-border learning and permit comparative assessment of IBLI performance in different institutional and economic contexts, laying the foundation for dissemination to other regions with significant poverty and livestock populations. Given that Ethiopia is a country expected to feel the early effects of climate change, this project also plans to incorporate Intergovernmental Panel on Climate Change (IPCC) predictions of climate change and associated rangeland biomass dynamics in order to explore dynamic pricing and the potential for conditional insurance transfer programs linking livestock insurance with individual behaviors to adapt to climate change.

- Insuring Against the Weather: Integrating generic weather index products with group-based savings and loans. Carlos Martins-Filho: University of Colorado. *Flood insurance in Bangladesh and drought and frost insurance in Ethiopia.*

This project focuses on linking risk management products, specifically weather index insurance, with network based savings, gifts and loans. The research will focus on developing simple, flexible and inclusive index insurance products, and learning how to link them with savings or credit to reduce the impact of basis risk inherent in any index product. This research aims to increase knowledge on how linking insurance and credit can strengthen credit markets in rural areas. In both Ethiopia and Bangladesh the project will partner with trusted microfinance groups working

within the target community. The multiple country strategy will allow comparisons of implementation strategies and successes, with the aim of establishing best practices for linking microfinance and index insurance.

- Index-based Weather Insurance for Coffee Cooperatives in Guatemala. Elisabeth Sadoulet: University of California, Berkeley. *Weather-based index insurance for small coffee producers in Guatemala.*

This weather-based index insurance project aims to offer improved risk management options to both individuals and cooperatives growing coffee in Guatemala. Interlinked transactions among members and ownership of collective assets suggest that group insurance can take advantage of economies of scale and provide benefits in excess of the sum of benefits from individual contracts. The relative merits of group or individual contracts will be rigorously explored as well as determinants involved in choosing a contract. Contract choice will inform policy makers and allow for optimal design of future insurance contracts.

- Interlinking Weather Index Insurance with Credit to Alleviate Market Failures and Improve Agricultural Productivity in Rural Ethiopia. Craig McIntosh: University of California, San Diego. *Rainfall-based index mapped to agro-ecological zones for crops in Ethiopia.*

This project aims to use weather-based index insurance to tackle the interlocking market failures that currently inhibit rural development, low fertilizer use and low credit uptake. By addressing investment, credit and insurance failures, the project will pilot a form of insured credit to local cooperatives. In years of poor harvest the insurance will pay back the annual investment required for farming, thus providing a comprehensive risk management tool for Ethiopian farmers. The provision of insured credit should crowd-in investment and inform best practices from other I4 projects that are also linking credit and insurance.

- Group Insurance: The Case of Cotton Producers in Mali. Marc Bellemare: Duke University. *Area-based yield index for cotton farmers in Mali.*

This project has designed a district-level area-based yield index insurance product for cotton producers in Mali. In Mali cotton producers are organized into cooperatives and are jointly liable for investment loans that cover seed and fertilizer inputs. By targeting cooperative groups who are vulnerable to loan default from variable weather, this pilot will provide insight into both cooperative risk management strategies and joint liability. By comparing with other I4 activities focusing on group-based contracts or credit linkages, this project should allow unique comparisons and inform best practices.

At the end of the seed grant period each project will be required to detail the successes and hurdles overcome during seed activities, as well as to demonstrate the feasibility of a long-term pilot activity. Selection of final projects will mirror the selection criteria for the seed grants in addition to developing local partnerships, capacity building and a delivery strategy of the product.

In addition to selection of the seed grant pilots, I4 held discussions with USAID and USDA to explore holding a knowledge-sharing event between USAID and USDA. This event is scheduled for spring 2011.

We also held discussions with the World Bank regarding using I4's comparative advantage in non-weather indices to design a training module that builds upon the existing World Bank weather index training. I4 has started designing the module and plans to conduct the training in East Africa in summer 2011. Prior to a comprehensive training, I4 will host a one-day event to promote understanding and development of index insurance products and the advantages they could potentially offer to poor, rural clients in Ethiopia. The event is scheduled for December 2010.

I4 INNOVATIONS

I4 aims to develop best practices and promote innovations in index insurance. These include improved understanding of insurance through educational games and demand-driven contract design with dual strikepoints, both of these innovations are discussed below. Another demand-driven contract design innovation was discussed in detail in the section on the Peru pilot.

Insuring small farmers. Farmers like these selling produce in Ethiopia will benefit from an I4 pilot that uses weather-based index insurance to help increase fertilizer use and access to credit. Photo by Craig McIntosh.

In order for risk management benefits to be realized, purchasers need to understand the benefits and specific characteristics of index insurance. For those who have never been exposed to insurance, education is a crucial first step. Insurance is unique in the world of financial tools in that it offers uncertain benefits: some years purchasers will receive payment and some years they will not. The purchaser makes a decision to protect him or herself in the future using assets or funds that he or she could otherwise spend in the present. I4 has pioneered the development of educational games to explain the complex characteristics of insurance to rural farmers. The games simulate purchasing decisions, farming outcomes and indemnity payments using real-world probability outcomes, thus allowing the farmer to see the uncertainty and time elements of insurance. The games improve the financial literacy of participants and allow for informed decisions in purchasing insurance.

Another I4 innovation involves determining the strikepoint, or critical level, of an insurance contract. In an insurance contract, the strikepoint determines the threshold that must be crossed in order for an indemnity to be paid. In a contract, if the strikepoint were 200 mm of rain, in a year with 199 mm of rain or less the purchaser would receive an indemnity payout. In basic index insurance contracts there is a single strikepoint that prompts an indemnity payment, yet this contract structure may not induce demand nor optimize purchaser welfare. The choice of the strikepoint is crucial and involves a tradeoff: if it is too high the cost of the premium may discourage farmers from purchasing the product but if it is too low it will result in infrequent indemnity payments. Both issues will greatly influence demand. In Mali these factors were considered to create an innovative contract design with a double-strike point, with indemnity payouts determined by the critical value reached. When the second strikepoint was reached, the second strikepoint indicating a poorer harvest, indemnity was higher per unit lower output reflecting the increased consequences of a more severe harvest. The advantage of the dual strikepoint is that it increases frequency of payments to farmers while not dramatically increasing premiums. By being a demand-driven design, uptake is expected to be higher which should make the insurance portfolio more attractive to reinsurance companies. I4 is piloting this innovative contract design, driven by demand considerations, which should improve farmer welfare as well as increase commercial viability of the insurance product.

MICRO-HEALTH INSURANCE IN RURAL CAMBODIA:

EVALUATION OF THE IMPACT ON THE STABILIZATION OF INCOMES AND ENHANCEMENT OF AGRICULTURAL PRODUCTIVITY AND ASSET ACCUMULATION

Principal Investigators

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http://www.basis.wisc.edu/projects_ama/micro_health_insurance.html

The research carried out a randomized controlled trial of the GRET/SKY micro-health insurance program in rural Cambodia. The SKY program intends to insure households against health shocks, and hopes to be financially sustainable by attracting a diverse pool of members. At the same time, by partnering with only public health facilities, they wish to encourage use of these facilities.

Our project measures whether households are using insurance as intended and visiting facilities for necessary health care. In addition, our work highlights issues in the way SKY is marketed that may lead to unintended consequences for selection into the program. The results can help inform policy-makers' decisions about the role of private health insurance. If our project shows that Sky does a good job in protecting health, increasing health care utilization among the ill, and facilitating asset accumulation, then there is more justification for policy-makers to address obstacles to the spread of health insurance.

Additional support

Agence française de développement: $580,374

Fung Foundation (support ended 12/31/09): $ 98,000

Center on the Economics and Demography of Aging (support ended 12/31/07): $ 24,072

Outputs

BASIS Brief no. 2007-05. *Insuring Health: Testing the Effectiveness of Micro-health Insurance to Promote Economic Wellbeing for the Poor*, by David I. Levine, Nhong Hema, and Ian Ramage. July 2007.

Levine, David I., and Rachel Gardner, with Gabriel Pictet, Rachel Polimeni and Ian Ramage. 2009. "Policy Brief: Results of the First Health Centre Survey." http://www.basis.wisc.edu/live/Health%20Centre%20Baseline%202009.pdf

Levine, David I., Ian Ramage and Nhong Hema. 2007. "Final Evaluation Design." http://www.basis.wisc.edu/documents/Final_Evaluation_Design_Cambodia.pdf

ACTIVITIES

We evaluated the SKY micro-health insurance program in order to:

- determine what characteristics of health insurance are appealing to potential buyers
- determine who is benefiting from health insurance, and whether the targeted population is benefiting
- determine whether the current SKY insurance methodology is working as intended
- understand how families cope with negative health shocks, and how insurance changes that behavior
- understand whether voluntary health insurance is a viable option in a development setting given the risk of adverse selection.

More than 5,300 households were interviewed during the first and second rounds of the household survey. We then compiled village monographs based on qualitative interviews with households and key informants in villages where SKY has worked for several years. The monographs study village dynamics help us understand health care use, health-seeking behavior and the motivation for insurance take-up and drop-out. A report based on the village monographs will be available this year.

We also used household logbooks, which contain a daily record of the health events encountered by the household. Through these we collect data on diseases, costs and health-seeking behaviour. The logbooks capture seasonal cycles of diseases, such as dengue, correlation of symptoms, and accidents related to agricultural work.

We carried out a survey of health centers to help describe their quality. We have seen some improvement in areas such as opening hours and drug stocks. Conversely, hygiene and cleanliness have substantial room for improvement. Our analysis of qualitative data from other sources and a second round of our health center survey, carried out in November 2010, will shed light on how SKY has influenced the quality of health centers.

We used these data from the household surveys, village meetings, the logbooks, and the health center survey to determine:

- Who joins SKY
- Who remains in SKY
- Among SKY members, who uses SKY-paid health care?
- What are the effects of SKY on health care use, health care costs, health, and financial and real assets and loans.

We carried out extensive training, offering undergraduate courses in research and evaluation continued at the Royal University of Phnom Penh (RUPP). These courses cover evaluation methodology and prepare students to run their own rigorous evaluations of programs in Cambodia. To date three one semester courses have been developed and taught with assistance from BASIS. The training introduces students to the concepts, principles, procedures and issues of the experimental method of studying human behavior and mental processes. The course develops knowledge and skills in designing and conducting experiments, writing and adequate and acceptable research report, as well as evaluating existing and future research. It is hoped that the students will gain a more scientific attitude in solving relevant human problems.

Overall, 252 undergraduate students at RUPP have benefited from the capacity building support. Enrollment in the courses has increased each year, which shows that both students and faculty value these courses. There is a demonstrable improvement in student understanding of research design and methods. We expect these outcomes to become apparent in the coming year as some students design their undergraduate projects.

Also, we taught a semester-long course on rigorous evaluations to UC Berkeley students in 2008, 2009 and 2010 (http://www.decal.org/file/800; http://www.ocf.berkeley.edu/~garret/decal09.html). This course was very well received by students.

FINDINGS

Our main result is that SKY does a good job in reaching its target audience, the rural poor, who have a high need for insurance because health care costs are frequent and often devastating.

While SKY targets the poor, it also tries to avoid financial losses. SKY would have a more challenging time being financially sustainable if it suffered adverse selection. Thus, the policy includes several terms that limit adverse selection. For example, SKY does not

cover chronic conditions such as high blood pressure. In addition, SKY does not pay for the delivery of babies within the first few months of joining. A government policy also reduces adverse selection: separate government programs pay for 100% of the cost of drugs for HIV/AIDS and tuberculosis.

We examined a number of dimensions of adverse selection. On some dimensions, SKY had no disadvantage. For example, in Cambodia (as in most of the world) both the very young and the elderly use more health services than others. SKY households do not have a particularly high share of either young children or the elderly. On other dimensions, SKY faces substantial adverse selection. In the year prior to our survey about 19% of SKY household has someone who was disabled more than six days due to health problems. This was almost twice the rate of non-SKY households (11%). At the same time, SKY members and non-members reported similar rates of health care utilization during serious health problems in the three months prior to joining SKY.

Economic theory suggests that adverse selection should be more severe at higher prices. At low prices, even the healthy find insurance attractive; in the extreme case of no cost everyone is covered and there is no adverse selection. We offered randomly chosen households a coupon to purchase SKY insurance at a steep discount. Consistent with theory, the adverse selection in terms of higher rates of disability lasting over six days only appeared for households paying the normal price.

If adverse selection is more severe at higher prices, then purchasers at the regular price will have higher health care use than purchasers at a discounted price. We found this to be supported by the data when comparing purchasers with similar baseline characteristics. These results imply that consumers can predict their future health care, and those predicting higher care will be more likely to join SKY at a high price.

SKY also faces adverse selection in retaining members, with those who use health care (especially recently) being much more likely to remain SKY members than household that never or rarely use SKY-funded health care.

SKY would have an easier time being financially sustainable if it enjoyed positive selection, where good risks purchased insurance more often. In fact, SKY members and non-members have similar education. This result is surprising, as health insurance is a novel product in this region. Potential customers have a difficult time understanding the complex SKY contract, and we expected SKY buyers to be above-average in education.

SKY members also show no positive selection in terms of risk aversion. SKY members and non-members have similar levels of risk aversion on both of our measures of risk.

Our experimental manipulation of prices from the randomized coupons shows that, at the regular price, less than 10% of households join SKY. At both regular and low prices, most households drop out within the first year of joining. Furthermore, SKY membership:

- does not increase preventative care
- increases use of public facilities after serious health shocks

At regular prices for health insurance, less than 10% of households join SKY.

- cuts in half the number of those who forego care due to lack of money
- does not speed time until receiving care
- does not improve health (as measured by self-reported health and by the share of children who are stunted or wasted)
- cuts in half the share of households paying over $100 for care of serious incidents
- cuts in half the share of households taking on new debt when ill
- cuts in half the share of households selling land
- does not detectably improve accumulation of assets (cash, gold, etc.) or human capital (school enrollment).

In short, SKY helps protect the financial status of insured homes, but has smaller effects (if any) on access to health care or on short-term health.

UNDERSTANDING THE IMPACT OF IDIOSYNCRATIC SHOCKS ON FARM PRODUCTIVITY AND HOUSEHOLD ASSETS IN ETHIOPIA, GHANA AND BANGLADESH

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http://www.basis.wisc.edu/projects_ama/idiosyncratic_shock_risk.html

New evidence that idiosyncratic risk dominates covariate risk in rural Africa and Asia indicates the potential contribution of improved local risk management to household asset accumulation, productivity growth and poverty reduction in developing countries. This research aims to clarify what existing mechanisms help households through episodes of negative shocks, what gaps in coverage exist, and how different interventions affect productivity in Bangladesh, Ethiopia and Ghana.

Risk and poverty are key, inextricable concerns in those countries. Our research focuses on the impact of idiosyncratic risk on asset poverty and the mechanisms available to redress it. Each county has an existing dataset that pays significant attention to risk issues, social networks and gender. These data allow us to examine the impact of idiosyncratic risk on asset accumulation and welfare dynamics.

Better understanding of idiosyncratic risk and how it affects the long-term wellbeing of households will inform policies that help individuals, households and communities manage risk without being overly interventionist. The research will help inform public health debates about helping households and small producers manage illness and disease, a key are of interest in Africa and beyond.

Additional support

NSF Doctoral Dissertation Improvement Grant: $29,000.

International Growth Centre: $28,000 to support the Ghana work.

NSF Doctoral Dissertation Improvement Grant: $29,000.

UK Economic and Social Research Council: $500,000 to analyze the long-term impact of anti-poverty interventions, using the same Bangladesh dataset.

Collaborations

This project builds on the earlier BASIS CRSP project, "Conceptual and Statistical Foundations for the Estimation of Poverty Traps," which developed the concepts and methods employed in this project.

In Bangladesh, the project builds on data collected as part of a longitudinal study funded by the Chronic Poverty Research Centre, HarvestPlus, the University of Waikato, and the Systemwide Initiative on Collective Action and Property Rights (CAPRi) of the CGIAR. Additional funding was secured from the Department for International Development (UK) and the Economic and Social Research Council.

In Ethiopia, this project linked with the World Bank capacity building project, "Pathways from poverty in Ethiopia: Strengthening Ethiopia's PRSP through the analysis of longitudinal household data." We work with IFPRI's ESSP program, funded by a consortium of donors and linked to high-level policy-makers in Ethiopia.

In Ghana the project builds on the USAID SAGA cooperative agreement, which funded closely related policy research and outreach in Ghana and helped ISSER found the highly successful Economy of Ghana Network (http://www.egnghana.org/).

Outputs

BASIS Brief no. 2008-06. Bhattamishra, Ruchira and Barrett, Christopher B. "Community-Based Risk Management Arrangements."

BASIS Brief no. 2007-03. Barrett, Christopher B., Ernest Aryeetey, Agnes Quisumbing, Akhter Ahmed, John Hoddinott, Felix Naschold, Jacqueline Vanderpuye-Orgle and Tassew Woldehanna. *Local Risk Management: Protecting Household Asset Building and Farm Productivity from Idiosyncratic Shocks.*

Bhattamishra, Ruchira and Christopher B. Barrett. *Community-based risk management arrangements: An overview and implications for social fund design.* http://www.basis.wisc.edu/documents/CBRMAs.pdf.

Dercon, S., J. Hoddinott and T. Woldehanna, 2009. "Growth, poverty and chronic poverty in rural Ethiopia: Evidence from 15 Communities." *Journal of Development Studies*.

Naschold, F. and C.B. Barrett. Forthcoming. "Do Short-Term Observed Income Changes Overstate Structural Economic Mobility?" *Oxford Bulletin of Economics and Statistics*.

Quisumbing, A. 2009. Beyond the bari: Gender, Groups, and Social Relations in Rural Bangladesh. CAPRi Working Paper No. 96.

Quisumbing, A. and B. Baulch. 2009. Assets and poverty traps in rural Bangladesh. CPRC Working Paper 143. Manchester, UK: Chronic Poverty Research Center.

Quisumbing, Agnes. 2007. "Poverty transitions, shocks and consumption in rural Bangladesh: Preliminary results from a longitudinal household survey." CPRC Working Paper 105, October.

Quisumbing, Agnes. 2008. "Determinants of poverty reduction." *The dynamics of poverty in rural Bangladesh Briefing Paper No.2*, IFPRI and Chronic Poverty Research Center.

Ruchira Bhattamishra and Christopher B. Barrett. 2010. "Community-Based Risk Management Arrangements: A Review." *World Development* 38(7): 923-932.

Vanderpuye-Orgle, J. and C.B. Barrett. 2009. "Risk Management and Social Visibility in Ghana." *African Development Review* 21(1): 5-35.

Press coverage in Bangladesh

http://www.newagebd.com/2008/apr/06/nat.html

http://www.thedailystar.net/pf_story.php?nid=30963

http://nation.ittefaq.com/issues/2008/04/06/news0713.htm

http://nation.ittefaq.com/issues/2008/08/20/news0230.htm

Press coverage in Ghana

http://www.modernghana.com/news/212143/1/g8-call-for-tighter-investment-controls-in-africa.html

ACTIVITIES

Bangladesh: Data collection is complete; no new data was collected this year. The paper on determinants of group membership and social relations was revised and released as a CAPRi working paper. Further analysis is being undertaken on gender-differentiated asset dynamics. We held community-level stakeholder meetings to disseminate results as part of a CAPRi-organized field visit.

Ethiopia: Data collection is complete; no new data was collected. Preliminary analysis of poverty and consumption dynamics was completed. A paper on the potential of index-based insurance was completed.

We held a researcher "write-shop" to review the data collected in 2009. Presentations on trends in poverty, consumption and welfare were made at IFPRI's Ethiopian Strategic Support Program conference in Addis Ababa. This conference was attended by more than 100 Ethiopian academics, policy-makers and civil society representatives. These presentations were also made in June 2010 at the annual meetings of the Ethiopian Economics Association. In April 2010, preliminary results were presented in a private briefing for the Chief Economist to the Prime Minister and a member of the Cabinet. Preliminary results on index insurance were presented at seminars at the Ethiopian Development Research Institute and at IFPRI.

We began to create comparable variables on shocks, consumption, and assets using the panel data in Bangladesh and Ethiopia.

Ghana: Data collection on the Akuapem South panel was completed. The 2009 survey comprised five rounds of bimonthly panel data on household income, consumption expenditure, farming activity and transfers, plus additional modules on social networks, shocks and risk perceptions, housing, membership of organizations and co-operatives, family background, marital attitudes and education.

These data are supplemented by two experiments. The first tests the effect of unanticipated positive income shocks on consumption and transfers. The second tests the effectiveness, among villagers, of different incentives to contribute to public goods. We supplemented these quantitative data with focus group discussions with farmer organizations in July 2010 intended to understand patterns of pineapple market participation and management of major covariate market shocks.

Villagers inspecting the junior secondary school in Darmang that was renovated with funds from the project's public goods experiment. Photo by Thomas Walker.

We prepared a technical summary of the 2009 survey data, with summary statistics, plot and social network maps, and analysis of the wealth dynamics since the previous survey waves (in 1997-98 and 2004). This report was disseminated in abridged form to the survey villages as part of our outreach efforts.

We drafted another paper to analyze the winners and losers from major structural changes in the export pineapple market in the past decade, which has seen producers consolidate and many small farmers leave the industry. Analysis from that paper has been incorporated into a multi-country comparative paper on smallholder market participation that is being revised for journal submission.

A third paper assesses the effectiveness of incentives to contribute to public goods, making use of results from field experiments in the survey villages throughout the year. Findings were presented in a seminar, with presentations also made during follow-up visits to the survey villages in July 2010.

FINDINGS

Bangladesh. Preliminary findings on determinants of group and network formation found the following.

1. Participation in groups is driven mostly by women's participation in NGOs, and that group membership is progressive, with higher participation rates among the poor and those with smaller sizes of owned land. This is in large part due to the targeting mechanism and pro-poor orientation of NGOs.
2. In contrast to group membership, the strength of relationships with most, but not all, types of influential persons increases with human and physical wealth.
3. A husband's and a wife's human and physical assets do not have the same influence on group membership and relationship strength. A husband's years of schooling strengthen relationships with local officials, judges or lawyers, doctors, headmasters, big businessmen, and big landowners, while a wife's years of schooling exert a positive influence on relationships with judges and lawyers, doctors, and NGO officials.
4. Indicators of relative bargaining power within marriage have differential effects on group membership and social relations. Women who bring more assets to marriage and who live closer to their natal villages are more likely to belong to a group. Assets at marriage and distance to village of husbands and wives also have differential effects on relationship strength, indicating that spouses may not share the same preferences nor invest in the same way in relationships with powerful and influential people.

Preliminary results from the study on gender-differentiated asset dynamics show that asset dynamics for husband-owned, wife-owned, and jointly-owned land and assets are different, with the finding that wives are less able to accumulate assets—particularly land—than men. Husbands' and wives' asset stocks are drawn down for different kinds of shocks, with husbands' assets being liquidated in response to dowry and wedding expenses, and wives' assets being negatively affected by illness shocks. Given that illness shocks are the most frequently-reported idiosyncratic shock in Bangladesh, health insurance may be an important way to protect assets, particularly women's assets.

Ethiopia. In the context of rapidly rising prices, and diverse movement across different areas, consumption and poverty dynamics are sensitive to how nominal expenditures are deflated. Extensive work with the data indicates that it is not advisable to rely on a single deflator but rather to calculate household-specific deflators. For each household, we take the consumption bundle in one base period and calculate the cost of that bundle in the other period. We found that average food price inflation according this measure was 145%. For 75% of our sample, the cost of their 2009 bundle was at least double in 2009 compared to 2004.

Another way of using the data is to construct an (approximate) measure of money metric utility: Money metric utility=expenditure (bundle 2009, 2004 prices)/expenditure (bundle 2004/2004 prices)

If this index is below one, there is a welfare loss as we would have spent less in 2004 to get the 2009 bundle at 2004 prices than we actually managed to spend at 2004 prices as observed in our data. We found that more than half the sample appears to have lost welfare in this period, but as some appear to have gained a lot, on average there was a 45% increase.

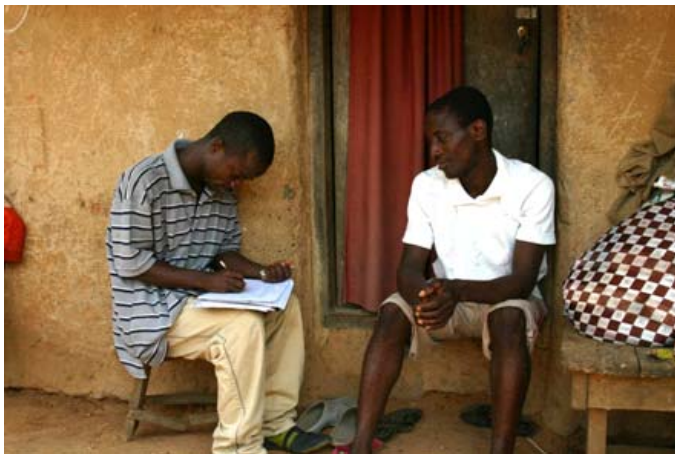
In a separate paper, we examined which farmers would be early entrants into weather-index insurance markets in Ethiopia, were such markets to develop on a large scale. Educated, rich and proactive individuals are more likely to purchase insurance. Risk aversion is associated with low insurance take-up suggesting that models of technology adoption can inform the purchase and spread of weather index insurance. We assessed willingness to pay and found that basis risk reduces demand for insurance when the benefits to insurance are lower, and provision of insurance through groups is preferred by female-headed households and individuals with lower education.

Ghana. Social insurance has the potential to fill the gap left by formal financial markets. However, access to these social insurance mechanisms is not uniform. Risk management in rural Ghana varies with the extent to which people are integrated into the social fabric of the village. We identified a subpopulation of villagers, some 8%, who are socially invisible in that they were not known by any other villager in random matching. Socially invisible individuals tend to be younger, poorer, engaged in farming, recent arrivals to the village, fostered, and not members of a major clan. There was evidence of considerable risk pooling among the socially visible to the extent that

individual shocks don't seem to cause large changes in consumption. In contrast, we rejected risk pooling for the socially invisible subpopulation. These findings suggest that social safety nets should be responsive primarily to covariate risk and to idiosyncratic risk of the socially invisible.

Our field experiment in Ghana measured the willingness of individuals in the study communities to contribute to the financing of local public projects. Individuals were asked five times during 2009 to donate to a public good for their community. The experiment employed two commonly used techniques to encourage contributions: a matching grant, and a provision point mechanism. Both were found to increase contributions, though the provision point mechanism was substantially more effective.

Using detailed survey data on participants and their social networks, we examined the characteristics that explain individuals' contribution decisions. Controlling for wealth and other characteristics, individuals who are better trusted by their peers contribute significantly more, but this result is not explained by their status alone. Indeed, we found that the contributions of community leaders were not significantly higher than others, but that new migrants to the community donate more than individuals with a family history in the community.



Interviews in Oboadaka, Ghana. Our research identified 8% of villagers who are "socially invisible." The findings reveal that social safety nets should be responsive to covariate risk and to idiosyncratic risk faced by the socially invisible. Photo by Thomas Walker.

Synthesis. We created an original and extensive overview of evidence on community-based risk management arrangements (CBRMAs) observed across the developing world. Those include traditional, indigenous, informal credit, savings and insurance arrangements as well as newer, semi-formal community-based microfinance, storage and insurance arrangements typically introduced by the government or an NGO. Our analysis underscores the fact that risk management and poverty are often intrinsically linked. If income is endogenous, asset risk can have a more permanent impact than one-off income risk. While CBRMAs can overcome some of the information asymmetries and enforcement costs that plague more formal mechanisms, to date there are no careful evaluations of the efficacy or the rate of return of CBRMAs. Such evidence, however, would be needed before commencing large scale financing of CBRMAs as part of social protection programs.

Empirical work on the effects of risk inevitably must rely on panel data. Much of the existing literature on risk and on welfare dynamics has to rely on panel data that cover only relatively short intervals between observations. We, however, found that (even when controlling for measurement error) the magnitude of welfare variability and, hence, of estimated risk, is systematically and inversely correlated to the time interval between panel observations. This highlights the importance of collecting long-run panel datasets to properly identify the extent of structural economic mobility and risk faced by households.

WEATHER INSURANCE, PRICE INFORMATION AND HEDGING: FINANCIAL INITIATIVES TO HELP THE POOR MANAGE AGRICULTURAL RISK (INDIA)

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http://www.basis.wisc.edu/projects_ama/Weather_Insurance_India.html

Among approximately 150 million rural households in India, roughly 60% are said to be engaged in agriculture. Within this group, almost 80% of all operational landholdings are accounted for by small and marginal farmers. Such individuals are predominantly subsistence farmers earning thin margins after each harvest. These farmers own few assets, are usually dependent on rainfall for irrigation, and have limited or no access to formal means of risk management. One of the most significant barriers to asset accumulation for poor households in India has been the risk of income shocks. A drought or an unexpectedly low price for a main crop can harm an entire village. Informal risk-sharing networks, though well-suited for household level shocks such as death or illness, may break down when aggregate shocks arrive. Poor households can be driven to near bankruptcy, obliging members to borrow at high interest rates, migrate, or reduce investment in children's education. Selling assets is a common coping mechanism. Yet during an aggregate shock, everyone in the area is affected, so demand for assets is very low while supply is high, reducing the value of assets and thereby reducing the ability to pay off debt or finance future consumption.

Traditional crop insurance schemes such as the National Agricultural Insurance Scheme (NAIS) are thought to cover roughly 15% of farmers, leaving a large majority of farmers without adequate means to manage household risk. This project, involving hundreds of rural villages across six districts in Gujarat, India, is developing a complementary pair of initiatives to address risk, and evaluate their efficacy with a series of a randomized field experiments. The first initiative, rainfall insurance, is an index-based financial product that provides policy holders a cash payout in the event of excess and deficit rainfall during the summer growing season, or *kharif*. Rainfall insurance mitigates risk relating to the quantity of agricultural output.

The second initiative, price information and hedging, provides farmers with commodity futures prices so as to aid them in making sowing and storage decisions, as well as in signaling when optimal selling decisions could be made. We disseminate spot prices at harvest time, which should reduce the chance farmers realize a poor price, either by informing farmers on which markets to travel, or aiding in price negotiations.

Collaborations

We worked with the World Bank and the Federal Reserve Bank of New York on a closely related project that provided particularly large rainfall insurance policies to 50% of a sample of approximately 1,500 farming households in Andhra Pradesh, India. The rains in Andhra Pradesh were particularly poor, and the payouts are expected to be quite large (up to ¼ of the value of a farmer's typical income). We therefore expect to detect substantial consumption smoothing and investment effects.

With the Institute for Financial Management and Research, we explored a project using mobile phone technology to assist farmers with marketing their output, and solving other research bottlenecks. A separate ground staff in Ahmadabad has been hired for this project, funded by AusAID, but there will be significant complementarities and spillovers between the futures price information project and our AMA project.

Outputs

BASIS Brief no. 2010-09. Marketing Complex Financial Products in Emerging Markets: Evidence from Rainfall Insurance in India, by Sarthak Gaurav, Shawn Cole and Jeremy Tobacman.

BASIS Brief no. 2008-01. *Weather Insurance, Price Information, and Hedging: Helping the Poor Manage Risk*, by Shawn Cole, Raghabendra Chattopadhyay, Stefan Hunt, Jeremy Tobacman, and Petia Topalova.

Cole, Shawn, Xavier Gine, Jeremy Tobacman, Petia Topalova, Robert Townsend and James Vickery. 2008. "Barriers to Household Risk Management: Evidence from India." Harvard Business School Finance Working Paper No. 09-116. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1374076#. Also appears as Federal Reserve Bank of New York Staff Report 373.

Gine, Xavier, Robert M. Townsend and James I. Vickery. 2007. "Patterns of Rainfall Insurance Participation in Rural India." World Bank Policy Research Working Paper 4408. http://ideas.repec.org/p/wbk/wbrwps/4408.html

Operations manuals on the futures price information and weather insurance. An instructional video on futures markets.

ACTIVITIES

Weather insurance. Households were offered a weather insurance policy underwritten by Agricultural Insurance Company of India. Our partner, the Self-Employed Women's Association (SEWA), marketed the product to households in the treatment group for the main 2010 growing season. We randomly assigned discounts on individual policies and randomly offered single policy or a package of four policies at the sub-district level. These randomizations allow evaluation of the impact of insurance adoption and analysis of how willingness to pay for insurance varies over time and with respect to past coverage level and payouts.

We offered the households a loan for the premium amount to be paid back at payout time. This addressed liquidity constraints. Preliminary results indicate that in a bundle of four policies, being offered a loan has a significant effect on willingness to pay.

This was the first year that there was a payout, which had a positive effect on take-up for the next *kharif.* Farmers who bought insurance were informed of the payouts and SEWA teams distributed payouts. Immediately after payouts, the research team conducted a follow-up household survey in which the 1900 households of the original sample were surveyed along with 165 additional households who purchased a policy in 2009 and received a payout. These additional households were subsequently added to the sample.

A partnership with a bank allowed us to offer a subsidy of Rs. 150 per policy sold by SEWA, up to a total of Rs. 950,000. Our policies have a market price of Rs. 150, so for each policy sold, the subsidy was used to "buy" another policy for the purchaser. In effect this doubles the coverage of the policies while leaving the premium unchanged. In response to feedback from clients and SEWA, the two notable changes were made in the policy: five phases of coverage were built in to the terms instead of three, and two triggers and payout rates were included per phase.

One of our Indian Ph.D. students co-authored "Marketing Complex Financial Products in Emerging Markets: Evidence from Rainfall Insurance in India." Another Indian Ph.D. student, developed a framework for put options as risk management tools. A final student on the project, pursuing a Ph.D. at the Wharton School, assembled a panel dataset and performed analysis from various waves of survey data. He traveled to Ahmedabad to conduct laboratory experiment aimed at understanding consumer behavior and uptake decisions for rainfall insurance.

SEWA workers marketing weather insurance policies to village households. We found that families were willing to pay for insurance but generally at prices substantially below the current market price. This suggests that subsidies or improved efficiencies in pricing may be needed to facilitate dramatic increases in risk coverage. Photo by Prashant Parmar.

Price information and hedging. We are refining the futures delivery mechanism based on lessons learned. In order to better understand the effect of providing futures prices to farmers we have begun to roll out a futures price information dissemination service by mobile phone, making spot and futures prices available to farmers by text messages. Mobile technology is an efficient way to disseminate time-sensitive information, accessible at a relatively low cost to the recipient. As the cost of acquiring price information falls, farmers should consume more information. Previously, farmers had to travel to price boards to check futures prices; now they only have to check their phones. Mobile technology makes it possible for information to be differentiated at the individual level, catering to farmer preferences and providing insight into how information spreads among farmers.

The shift to mobile phones as the medium for dissemination of information coincides with a shift to mobile phones as the medium for surveying farmers about their expectations and decisions. The lower cost of conducting phone surveys enables more frequent surveys, which in turn paints a more nuanced picture of how price expectations change over time. Obtaining very precise information on outcomes is important for a correct cost-benefit analysis. These real-time surveys over mobile phone will help build understanding on exactly when farmers plant crops and what price expectations they have.

Nokia donated mobile phones, which were used to deliver prices on a weekly basis. This system continues to be an effective and low-cost mechanism to ensure that consistent and accurate price information reaches futures boards in all treatment villages.

The National Commodity and Derivatives Exchange Limited (NCDEX) provided daily spot and future price information for cotton, castor and guar for up to three local and national markets to 400 farmers in 80 out of 108 villages in our existing futures price study sample. Using a cross-cutting randomized control trial design allows us to evaluate the differential effect of receiving various mobile phone information packages and gain insight into how information is passed along social networks.

Price board showing spot and future prices of cotton, castor and guar. The project is experimenting with using mobile phones to deliver consistent and accurate price information to treatment villages in real time. The prices then are added to futures boards like this one.

Randomizing at both the village and the individual level facilitates a nuanced evaluation precluded by the price board intervention, in which the type and availability of information is uniform within and across villages in the treatment group.

The latest round of surveying includes a number of questions that look at rigidities in the sowing process such as crop rotation cycles in an effort to understand other constraints in adjusting to prices. We augmented the survey with a number of questions on agricultural inputs that aim to more accurately measure farmers' shifts in the allocation of marginal agricultural inputs over time.

We were unable to offer put options for regulatory reasons. While put options for agricultural commodities remain illegal in India, we continue to provide price information and futures market education, and work with the commodities exchange to communicate the value of options to the regulatory authorities.

SEWA trainers, previously trained by NCDEX professionals, in turn trained farmers in villages where phone-based delivery of futures prices to individual farmers was piloted. While no formal training was offered this year, SEWA employees were available to answer questions, and a telephone "help line" was set up. We intend to conduct trainings again in the next round of surveying. In preparation for this, we will continue to work with NCDEX to improve the training module and the futures market training video.

FINDINGS

Our sales method, novel for a financial product, revealed household willingness to pay in an incentive-compatible manner. Preliminary results suggest that many households were willing to pay prices that are substantially below current market price of insurance. This suggests that either subsidies, or improved efficiencies in pricing, may be necessary to facilitate dramatic increases in risk coverage. As noted, we were able to provide such subsidies this year. Households' willingness to pay for insurance also increased substantially when offered a loan to cover the premium, albeit for the larger four policy bundle, and not for single policies. In previous years the good rains had led to no payouts for the policies. However, over 60% of 2009 purchasers received a payout from the policy. This helped build trust in the policy and in SEWA.

Viewing a price board. Farmers who received financial and futures training from a module designed by the AMA project in collaboration with NCDEX show greater understanding and, importantly, *trust in* the futures and financial markets. These farmers are more likely to use future prices to form their agricultural decisions.

Perhaps as a result of these factors, sales this year were the highest so far, with a total of 1775 of 3943 eligible households purchasing 6384 policies. In spite of the complexity of the product, we may be seeing that a great deal of learning has occurred over the years.

In the price information and hedging project, the main findings suggest that farmers in the treatment group have a better understanding and trust of futures and financial markets, and are more likely to use future prices to form price expectations than the control group. Farmers have now received three rounds of futures training using the comprehensive module and training video designed in collaboration with NCDEX. We hope to see the effects of this training on the extent to which farmers incorporate futures price information into their agricultural decisions.

A Productive Safety Net for Northern Kenya's Arid and Semi-Arid Lands:

The HSNP+ Program

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http://www.basis.wisc.edu/projects_ama/HSNP_Kenya.html

The Hunger Safety Net Program (HSNP) launched in Northern Kenya provides reliable cash transfers to poor households. Given the considerable risk faced by households in the arid and semi-arid lands (ASAL) of Kenya, theory and empirical evidence both suggest that there may be considerable value added from augmenting HSNP with a productive safety net (PSN). The addition of the PSN can have three key effects:

1. stem the downward spiral of vulnerable households into poverty
2. stabilize pathways from poverty through asset accumulation
3. crowd-in finance for ancillary investment and growth.

To achieve these impacts, a PSN needs to reliably and predictably compensate ASAL households for asset losses. Conventional insurance is not feasible. Researchers are working on an Index Based Livestock Insurance (IBLI) scheme that can be used as a foundation for the PSN program.

The project evaluates the impact of both the HSNP and the PSN programs. The goal is to design interventions that not only serve the immediate needs of vulnerable households, but also put them on a long-term path to asset protection and improved productivity. The evaluation looks at households receiving both the HSNP and PSN interventions, those receiving only one, and those households that are not involved in either program. This will help inform the design of future cash transfer programs, and assess the utility of including PSN programs with them. The project looks at standard headcount/poverty gap measures, as well as asset accumulation, child education and health, and income and consumption to assess the household benefits of program participation.

Additional support

USAID Borlaug LEAP program: $19,997

DfID: $436,535

World Bank: $259,000.

Collaborations

This project builds on the USAID Global Livestock CRSP project on Pastoral Risk Management (PARIMA), which collected and analyzed household data from northern Kenya 1999-2005, and the Arid Lands Resource Management Project (ALRMP) based in the Ministry for the Development of Northern Kenya and other Arid Lands. Livestock mortality data from ALRMP was used to model the insurance contract and ALRMP staff facilitated field work associated with the development of IBLI.

The project is involved in a joint program involving a collaboration of ILRI with the Financial Sector Deepening Trust in Kenya, the Rockefeller Foundation and the World Bank's Commodity Risk Management Group. The goal of the collaboration is to help develop a broad range of index-insurance pilots for agriculture in Kenya.

In an effort to investigate other products similar to IBLI but in a different scale and context, we are investigating the feasibility of introducing index-based famine insurance in Kenya targeted to meso and macro level clients. We secured a multi-year grant from the Index Insurance Innovations Initiative (I4) to adapt IBLI for pastoralists in southern Ethiopia.

Outputs

BASIS Brief no. 2008-08. *Altering Poverty Dynamics with Index Insurance: Northern Kenya's HSNP+*, by Christopher B. Barrett, Michael R. Carter, Sommarat Chantarat, John McPeak, and Andrew Mude.

BASIS Brief no. 2008-07. *Insuring the Never before Insured: Explaining Index Insurance through Financial Education Games*, by Michael R. Carter, Christopher B. Barrett, Stephen Boucher, Sommarat Chantarat, Francisco Galarza, John McPeak, Andrew Mude and Carolina Trivelli. Spanish version available: Asegurando a los que nunca estuvieron asegurados: Explicando el seguro por índice a través de juegos de educación financiera.

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ACTIVITIES

The team completed all of its 2009-10 planned activities. Major activities involved:

- finalization of the index-based livestock insurance (IBLI) product design, as well as liaison with a Kenyan commercial underwriter (UAP Insurance), a retail financial institution (Equity Insurance Agency, EIA) and an international reinsurer (Swiss Re) to pilot IBLI
- coordination with the DfID-sponsored Hunger Safety Nets Program (HSNP) around monitoring and evaluation issues
- fielding a baseline survey in advance of the launch of IBLI so as to enable rigorous evaluation of IBLI's behavioral and welfare impacts over time
- write-up of results from the analytical work done in designing IBLI and from the financial education games our team ran in summer 2008 and fall 2009, as well as from the surveys in summer 2008.

Cattle at a water pan near the Ethiopia/Kenya border. As part of its evaluation of safety net programs in east Africa, this AMA project found that index-based livestock insurance can be easy to understand and attractive to both pastoralists and commercial financial institutions.

Coordination with various stakeholders is time consuming but necessary to ensure broad-based understanding of both the potential and limitations of this product. We attained regulatory approval to proceed from the Insurance Regulatory Agency (IRA) of Kenya. IRA's main concern was ensuring that the insured party's covered risk is very clear. We argued that one of the key benefits of an index-insurance product that drastically reduced transactions costs was that there was no need for insurance companies to verify actual livestock losses as payments were entirely a function of the index. As such, we recommended that insurance be sold without requiring the agent to verify if the client actually owns all the livestock that they intend to insure. This means there is no real way to ensure that the client will indeed face the risk that he is insuring against (drought related livestock mortality). IRA agreed to review the issue should the success of the pilot result in more comprehensive scale-out across the country.

After extensive negotiations with the commercial partners, the IBLI contract was set with the strike point at 15%. The price includes the full costs of commercial partner commissions and the relevant taxes. The difference is subsidized by donors. The expectation is that as the novelty of the product wears off and late-adopters enter the market, increased competition coupled with greater capacity in the industry will bring the price down.

In the research region, publicity is best received by word of mouth. We trained extension agents to engage with clients. We trained a selection of professionals working in relevant capacities or previously associated with the IBLI research process to be our master trainers (MT). From the target villages we also recruited village insurance promoters (VIPs). In addition to supervising the VIPs, MTs were expected to be able to answer any questions from clients, interested partners, and institutions related to the product's features and implementation process. VIPs covered the grassroots extension effort directed at potential clients.

The IBLI product was launched in January 2010 with a ceremony in Marsabit town. The launch was presided over by the CEO of Equity Bank and brought together high-ranking officials, including the Minister for Livestock and the local member of parliament as well as the Secretary General of the Supreme Council of Kenyan Muslims who endorsed the product. The high profile event generated significant buzz that travelled by word of mouth to various corners of the district; the launch also attracted the attention of national and international media. Until the end of February when the selling window closed, the MTs and VIPs fanned out to offer their extension services, and sales agents began, for the first time, to sell IBLI to clients across Marsabit district.

In the six weeks of sales after the launch, 1,979 individuals purchased insurance contracts to cover a total of 3908 cattle, 15,826 sheep and goats, and 339 camels. Total premiums collected came to US$46,597, with another US$30,000 in subsidies provided by donors to make up the full premiums paid to the underwriter and reinsurer. The pilot IBLI is an annual contract spanning March 2010 to February 2011, with prospective payoffs in both October 2010 and March 2011. The first half of the year was a good season, so no indemnity payments were due in October 2010.

In addition to launching the pilot and outreach activities, the team designed and fielded a baseline survey among 924 households in Marsabit district, stratified based on locations that did and did not receive HSNP cash transfers, and based on whether the team would randomly distribute IBLI discount coupons to encourage uptake or not. Ultimately, coupons were distributed to 551 households, representing around 60% of the sample.

Recipients were randomly selected and received discounts of 10%, 20%, 30%, 40%, 50%, or 60% of the premium for the first 15 Tropical Livestock Units covered. Of these, 223 coupons were redeemed with a total value of discounts adding to US$2,900. Based on results from the baseline survey, the team revised the questionnaire and added new modules to track household self-reported uptake of IBLI in preparation for the resurvey in October-November 2010.

We developed a local network of laptop computers loaded with software to run the financial education games developed and pilot-tested the previous project year. The hardware was loaded with the software and debugged in 2009. Once the systems were ready, we ran the financial education games in nine different locations, with 316 total participants in December 2009. These games were extremely valuable for promoting understanding of IBLI in target locations as well as for building interest in the product ahead of the marketing campaign that launched in January.

Transporting MTs and VIPs proved challenging due to the poor roads and the long distances that needed to be covered in Marsabit district. Consequently, many clients who expressed strong interest remained unserved and expressed frustration and lack of confidence in the product. We developed strategies that should help make the January/February 2011 sales period more effective in reaching all who have an interest in the product.

There is a need for insurance, but do people in the region want it? Focus group discussions, like this one in Wachille, southern Ethiopia, helped determine the interest of pastoralists in purchasing such insurance. In our pilot, nearly 2000 people purchased insurance covering over 20,000 livestock. The financial education games we carried out showed that farmers easily grasped the concepts of index-based insurance.

FINDINGS

It appears feasible to design index-based livestock insurance contracts that are both attractive to pastoralists who might individually purchase the contracts and to commercial financial institutions that must market, sell and underwrite the products. Statistical evaluation of the product through a range of different techniques clearly confirms the appeal of the product to stakeholders in the target locations and financial institutions.

It appears that financial education games can be successfully developed and fielded to capture the essence of complex IBLI products and that pastoralist and agro-pastoralist populations with little or no education can rapidly grasp these ideas so as to be able to make informed decisions as to whether or not they should purchase IBLI products as they come on the market. Refinements of the game protocol and development of a software platform should substantially enhance the generalizability and replicability of these tools.

There appears to be considerable demand for IBLI, as manifested by the relatively robust uptake of nearly 2000 individual purchasers of contracts during a brief, six-week marketing campaign in which the commercial delivery agents encountered many unexpected problems with their sales strategies. Interest in the product is tremendous, both within the region and among private sector, government and civil society actors elsewhere in Kenyan pastoral areas.

The loss of the satellite platform from which the NDVI data was to be obtained highlighted the need to develop back-up data systems in the design of these contracts. The team was able to backfit an alternative statistical series, but it was a great deal of work under intense time pressure and was not the optimal way to address such problems. In the future we will use either a more general indicator or develop built-in backup systems.

It is essential to work out detailed operational guidelines so that all partners know and accept their roles. The transition to full ownership of the product and all of its support activities by the private sector partners has been somewhat rockier than anticipated. Part of this is likely attributable to the fact that everyone is learning about the product as we go and thus there was no good operational manual in place. It would be desirable to prepare a detailed operational manual clearly outlining in detail the activities that each party must undertake, when, and how so that miscommunication and the considerable transactions costs of product delivery and management can be reduced. This will be essential for any scale up of IBLI.

The IBLI project won a best-practice award from the Poverty Reduction, Equity and Growth Network (PEGNET) in recognition of the project's innovative approach of combining scientific research and practice. This was awarded at the September PEGNET annual conference, held in Midrand, South Africa.

AREA BASED YIELD INSURANCE FOR PERUVIAN COASTAL AGRICULTURE

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http://www.basis.wisc.edu/projects_ama/Area_Based_Yield_Insurance_Peru.html

The potential benefits of agricultural insurance include greater willingness on the part of farmers to carry risk and engage in production strategies with higher returns, as well as increasing the provision of lending to agriculture. However, the design of sustainable insurance products for agriculture is very complicated. This project tests an area-based yield (ARBY) insurance scheme for small and medium sized producers in selected valleys of the Peruvian coast. This ARBY insurance product should give farmers a lower base risk than other types of index-based insurance programs.

The Peruvian government approved $30 million to strengthen rural financial markets, with the provision of index-based insurance as a top priority. We work with government officials, financial market providers, and the private insurance sector to help develop a product that can be offered to farmers in the market. By assessing the uptake and impact of this pilot project, researchers will be able to inform future activity of the Ministry of Agriculture in Peru.

Outputs

BASIS Brief no. 2008-07. “Insuring the Never before Insured: Explaining Index Insurance through Financial Education Games,” by Michael R. Carter, Christopher B. Barrett, Stephen Boucher, Sommarat Chantarat, Francisco Galarza, John McPeak, Andrew Mude and Carolina Trivelli. Available in Spanish.

BASIS Brief No. 46. “Can Insurance Unlock Agricultural Credit and Promote Economic Growth?” by Carolina Trivelli, Michael Carter, Francisco Galarza, Alvaro Tarazona, and Johanna Yancari. May 2006.

Carter, Michael R., Francisco Galarza and Stephen Boucher. “Underwriting Area-Based Yield Insurance to Crowd-In Credit Supply and Demand.” Forthcoming in Savings and Development.

Carter, Michael R., Stephen Boucher, and Carolina Trivelli. 2007. “Concept Note: Area-based Yield Insurance Pilot Project for Peruvian Coastal Agriculture. http://www.basis.wisc.edu/documents/ARBY CONCEPT NOTE.pdf. Available in Spanish: http://www.basis.wisc.edu/documents/ARBY_Nota_Coneptual.pdf

ACTIVITIES

IEP, La Positiva and CRAC Señor de Luren coordinated the various activities of the project. Throughout the year, the three institutions held periodic meetings and participated in major discussions about farm insurance with the Ministry of Agriculture, the Superintendent of Banking, Insurance and Pension Funds, and the Association of Insurance Companies (*Asociación de Empresas Aseguradoras*). They also participated in a public event organized by La Positiva Global AgRisk in Lima in August 2010.

Redesign of the insurance product. In coordination with the insurance firm La Positiva, we redesigned the *Agropositiva* farm insurance product. In February 2010, five focus groups (of between eight and 13 farmers each) were interviewed so that we could obtain recommendations for the redesign of insurance and the way it was offered during the next cotton growing season. All farmers who participated in the focus groups had been surveyed in 2009. Four of the groups consisted of farmers who received each of the four types of discount coupons for acquiring the insurance. The fifth group consisted of farmers surveyed in 2009 who purchased the insurance.

As a result, the insurance offered for the 2010-11 season was designed in such a way that more farmers could acquire it. The redesign consisted of dividing the insurance into two new products: *Agropositiva* and *Agropositiva Total*. Each offers different coverage, and each simplifies the indemnification structure.

Besides the redesign, other adjustments were necessary because the Ministry of Agriculture did not guarantee to continue its subsidies of part of the premium. In response, La Positiva and the IEP project agreed to cover an amount equal to the original subsidy.

During the 2009-10 season, when a single *Agropositiva* insurance product was offered, the trigger was 36 hundredweight per hectare and the per-hectare premium paid by the farmer was 127 nuevos soles. The *Agropositiva* indemnification had a different value for each level of yield (hundredweight per hectare) below the trigger.

For the 2010-11 season, in the redesigned product, the trigger for *Agropositiva Total* is 39 hundredweight per hectare and the premium paid by the farmer is 154 nuevos soles per insured hectare. The *Agropositiva Total* has only three indemnification amounts for three yield ranges below its trigger.

The trigger for *Agropositiva* is 33 hundredweight per hectare and the premium per insured hectare is 107 nuevos soles. The *Agropositiva* product has only two indemnification amounts for two ranges below its trigger. The table shows the comparison.

Yield survey. The yield survey, measuring the average yield of cotton in the Pisco Valley and used to determine the loss ratio, was carried out in June 2010. The survey was based on farmers in the Pisco Valley who reported that they would plant cotton under the crop and irrigation plan of 2008/2009. The survey was applied to 582 farmers distributed randomly in the valley (22.5% of the total number of farmers).

Average yield (hundredweight/ha)	Indemnification *Agropositiva Total* (S/.)	Indemnification *Agropositiva* (S/.)
39 to 33	150	--
33 to 26	775	775
Less than 26	1400	1400

The survey showed that average cotton yield in the Pisco Valley was 45.16 hundredweight per hectare, with a margin of error of 3.5% and a confidence level of 95%. The average cotton yield, based on the yield survey, was posted on 1 July in the offices of Caja Rural Señor de Luren and on the La Positiva website.

Discount coupons. Four types of discount coupons (for 15, 35, 65 and 90 nuevos soles) were distributed to the same 963 farmers who had received them in the previous two years. The face value of the coupon corresponded to a discount for acquiring *Agropositiva* or *Agropositiva Total*.

La Positiva was responsible for designing the coupons and IEP took charge of printing and distribution, which took place in August 2010. Unlike in previous years, this activity was carried out by people familiar with the Pisco Valley and trained in how insurance works. This change was made to ensure that farmers or families who received discount coupons would also receive information about the redesign of the insurance product. Any questions they had about insurance would be answered.

Promotion of the product. During the sales period, which ended on 20 November, the project supported a series of activities to promote the *Agropositiva* insurance product. These activities were coordinated by La Positiva with financial support from IEP and collaboration from CRAC Señor de Luren. Four events were held between September and November. Each event consisted of an informative meeting with farmers, a simple survey to determine if they understood how the insurance worked and if they had purchased it or would purchase it, and a raffle of farm tools.

Participants in the four events received invitations and raffle tickets ahead of time. The invitations and tickets were distributed by analysts from CRAC Señor de Luren and promoters from the Inca cotton gin to farmers (customers and non-customers) whom they considered appropriate recipients.

Nearly 250 farmers participated in the promotional activities, with 81 farmers coming to the fourth event held shortly before the end of the insurance sales period. The result of the activities is that, for the 2010-11 growing season, 669 hectares of cotton in the Pisco Valley were insured by 205 farmers.

AMA Research Theme:

Smallholder Access to Markets and Improved Technologies

With the globalization of markets, the role of small producers has changed dramatically. While there are new opportunities in the spread of high value exports and specialty cash crops, many small and medium-sized farmers have trouble meeting new quality standards, integrating into new distribution systems, and finding ways to enter global markets. They are missing out on higher return crops and are excluded from growth sectors.

AMA researchers are looking for ways to help small farmers be a part of the increasingly global marketplace by investigating new contracting mechanisms, the role of producer organizations, the impact of participating in modernizing value chains, and opportunities in specialty markets, including fair trade products. In order for globalization to have a positive effect on households at all levels, traditional small producers need to find ways to integrate themselves into new markets. The AMA projects generate practical business and policy strategies to help make this possible.

AMA Projects

- Access to Modernizing Value Chains by Small Farmers in Indonesia and Nicaragua
- Contracting Out of Poverty in Peru: Experimental Approaches
- Enhancing Smallholder Competitiveness in the Face of Globalization
- Savings, Subsidies, and Sustainable Food Security in Mozambique

AMA BASIS Briefs

BASIS Brief no. 2010-10. "Creating Incentives to Save among Microfinance Borrowers: A Behavioral Experiment from Guatemala," by Jesse Atkinson, Alain de Janvry, Craig McIntosh, and Elisabeth Sadoulet.

BASIS Brief no. 2010-08. Fair Trade and Free Entry: Examining Producer Benefits, by Alain de Janvry, Craig McIntosh, and Elisabeth Sadoulet. September 2010. 4 pages.

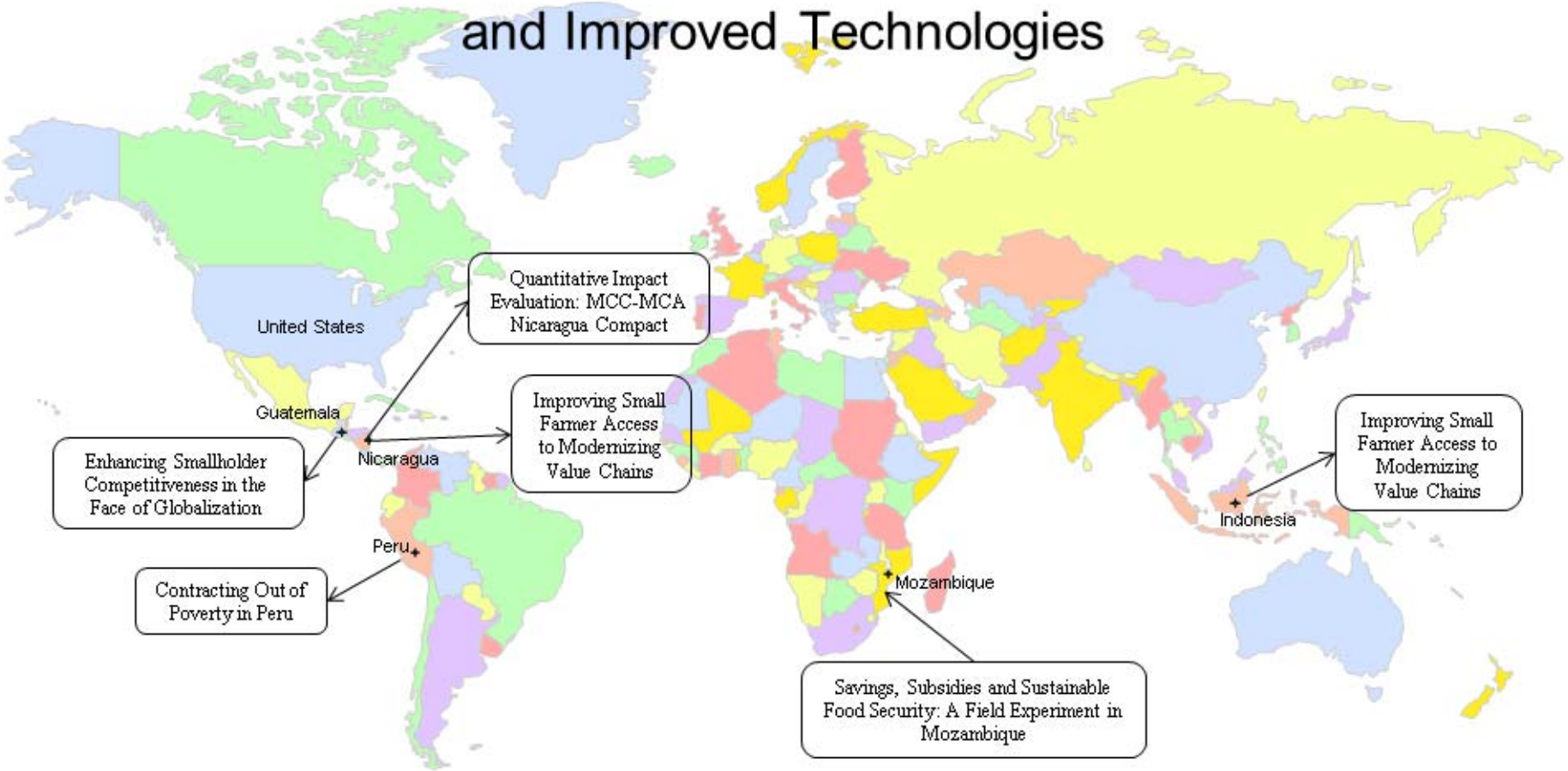
BASIS Brief no. 2010-04. "Subsidies and the consequences of drought: a Field Report," By Rachid Laajaj and Aniceto Da Fonseca Matias.

BASIS Brief no. 2010-02. "Savings, Subsidies and Sustainable Food Security in Mozambique," by Michael R. Carter, Rachid Laajaj and Dean Yang.

BASIS Brief no. 2007-06. *Improving Smallfarmer Access to Modernizing Value Chains in Indonesia and Nicaragua*, by Thomas Reardon, Ronnie S. Natawidjaja, and Francisco J. Perez.

BASIS Brief no. 2007-04. *Enhancing Smallholder Competitiveness in the Face of Globalization*, by Alain de Janvry, Elisabeth Sadoulet, Craig McIntosh and Tomas Rosada.

AMA CRSP: Smallholder Access to Markets and Improved Technologies



ACCESS TO MODERNIZING VALUE CHAINS BY SMALL FARMERS IN INDONESIA AND NICARAGUA

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http://www.basis.wisc.edu/projects_ama/modernizing_value_chains.html

The agri-food industry has transformed extremely quickly and profoundly over the past decade in developing regions, with rapid diffusion of supermarkets, fast food chains, and large-scale processors. This project examines the asset-related determinant and the impacts of the participation of small farmers and farmer organizations in modern versus traditional market channels in Indonesia and Nicaragua. The research

1. identifies the specific extent, nature and determinants of the restructuring of the product value chains
2. examines the determinants of inclusion or exclusion of small farmers in the restructured market channels
3. looks at the asset and income effects of this participation, with the goal of informing organizational, policy and institutional design to have maximum benefits of new markets to small farmers.

In Indonesia, supply chain mapping studies are underway for mangoes and mangosteen, both of which are priority products in the Ministry of Agriculture's long-term development plan and have domestic and export market potential. The research will help inform the work of the Ministry of Agriculture in the development of the horticulture division and the creation of policy that encourages value chains that serve cities and exports.

In Nicaragua, researchers focus on the role of "second floor cooperatives" that will help producers to access new markets, and inform the role of government in this process. The research will inform the new government focus on investments in small and medium rural enterprises and farmers.

Additional support

CIAT: $27,000.

Michigan State University: approximately $26,000 per year for the four years of the project.

Outputs

BASIS Brief no. 2007-06. “Improving Smallfarmer Access to Modernizing Value Chains in Indonesia and Nicaragua,” by Thomas Reardon, Ronnie S. Natawidjaja, and Francisco J. Perez.

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ACTIVITIES

Nicaragua

Horticultural product trader study. A total of 91 traders of lettuce, tomatoes, and sweet peppers were surveyed at 11 markets. Our report and a policy brief were finalized in the last quarter of 2010.

Horticultural producer modern channel participation survey. The student leading this effort wrote and defended her dissertation and contributed the project findings.

Horticultural (tomato, sweet pepper, lettuce) producer modern channel participation second survey. A plan was created to link research questions, conceptual model, implementation method, and the operational steps before field research took place. The plan identified the research issues and gap in knowledge, research questions/objectives and hypotheses, the main points of context about the value chains of lettuce, tomato and sweet peppers in Nicaragua, and the general methodology.

Data collection began in March 2010. Two rounds of data collection were completed in May. Data was entered and cleaned. We ended up with 905 survey interviews, 794 household interviews and 111 village/community interviews. Analysis is ongoing.

Indonesia

The Indonesia project started later than originally planned. Since mid-2010, the pace of work has accelerated, and it is likely that the project will still be able to finish before the end of the overall project period.

We planned studies on mango and mangosteen traders and producers, and a survey of households and sprayer traders. The farm survey was not finished until August 2010. Data were entered, and then we carefully assessed the questionnaires and entered data. We found that 25% of the data were unusable. We determined after careful enquiry that the supervision of the farm survey was faulty, important parts of the sprayer-trader survey were not done, and data entry was very poorly supervised.

After the long delays and faulty work, MSU terminated with cause the arrangement with CAPAS. We then contracted with ICASEPS, a well-known institution in Indonesia with a much better track record of survey implementation. This means we will not be able to help build capacity in CAPAS, but their severe internal management problems made this impossible. We will redo the farm survey from scratch starting in February 2011, and then do the trader survey.

The master's student at MSU delayed her work while the above difficulties unfolded. She is now on target to do her thesis and project reports in spring and summer 2011. She has done an excellent job in coursework and preparation for the survey.

We had a second master's student from CAPAS, but the student failed his courses and was terminated after one semester. The failure to provide an adequate second student was another reason we concluded that CAPAS was not competent.

FINDINGS

Due to the delays in work in Indonesia, our key findings come from the first two Nicaragua studies mentioned above.

Horticultural product trader study. The survey of tomatoes, lettuce, and sweet peppers traders used a base of 91 interviews in 11 wholesale markets in Nicaragua. The results center around five different products: roma and salad tomatoes, fancy bell and chiltoma sweet peppers, and iceberg lettuce (there are no gourmet lettuce varieties in any wholesale market in Nicaragua).

The share of wholesale markets over the total volume intermediated in Nicaragua shrunk over the last five years. This is a striking result as tomatoes in general have reduced their sold volumes by 26%, and lettuce has reduced its sold volumes by 25%.

These results perhaps confirm the information obtained through our key informant interviews. Retailers used to source through specialized wholesalers, who in turn sourced from wholesale markets. Increasingly, however, retailers source directly from farmers or farmers' cooperatives.

Another reason why the volumes at wholesale markets are shrinking, gleaned from the value chain key informant interviews, is that exports to other Central American countries have increased considerably in the last five years, reducing the volumes present in the wholesale markets, and increasing trade from wholesale markets in Nicaragua to other wholesale markets in El Salvador, Honduras and Guatemala.

The transition from niche to commodity is evident for fancy bell peppers and salad tomatoes at wholesale

markets. The volumes of fancy bell pepper and salad tomatoes have increased 220% and 165% respectively over the past five years. Shares of the overall volume of other niche products during the same period increased from 5% to 27% for sweet peppers and 6% to 18% for tomatoes, demonstrating that these so-called niche products are becoming staple products being intermediated at wholesale markets.

As shown in the table, all products are highly concentrated. Yet, wholesale of most products (4 out of 5) have deconcentrated during the past five years. Deconcentration of these products can be explained by two main reasons. For niche products (fancy sweet pepper and salad tomato) five years ago there were only a few wholesalers trading this type of product; now the number of wholesalers trading niche products has increased. Secondly, since modern retailers stopped sourcing from wholesale markets, the overall volume being traded in the wholesale market of commodities

Share of top five traders among all traders in wholesale markets in Nicaragua

Product	2009	2004
Chiltoma pepper	57%	48%
Fancy sweet pepper	89%	95%
Roma tomato	40%	48%
Salad tomato	60%	75%
Iceberg lettuce	54%	77%

(roma tomatoes and iceberg lettuce) has decreased. Retailers used to source from the top five traders. The reduction of the overall pie, induced by the reduction of the volume traded by the top five traders, caused deconcentration.

Chiltoma peppers are the only product that has increased its wholesale concentration over the past five years, which is the only commodity product that has increased its traded volume (11% increase) during this time lapse, and is the only product that is significantly sourced by modern retailers from wholesale markets (35% of the volume traded in wholesale markets is bought by supermarkets or dedicated wholesalers).

Most of the products in our study suffer clear seasonal effects, as winter volumes are considerably smaller than summer volumes (there is a reduction of 10-20% of volumes depending on the product). With the exception of fancy bell peppers, volumes have been very stable across seasons in the same year. This result might signal changes in the production systems of fancy bell peppers that allow for a steady volume along the same year.

Our results contradict the hypothesis that traditional value chains are long and have many intermediaries along the chain. Sixty percent of traditional wholesalers source their produce directly from farmers, especially in commodity products (chiltoma peppers and roma tomatoes).

Traders do not rely on own production. With the exception of lettuce, 22 % of traded volume is grown by the trader. In the rest of the analyzed products wholesalers tend to have very low shares of own-production (around 6% of total volume).

Results show the existence of implicit contracting schemes between farmers and traditional wholesalers. Around 60% of farmers supplying traditional wholesalers have formal verbal agreements with wholesalers, which imply the existence of contract schemes.

Horticultural producer modern channel participation survey. We analyzed the payoff and risk of contracting with Wal-Mart versus selling to the traditional market. Mean per unit farm gate revenues in the supermarket chain are not significantly higher than in the traditional market. A lack of a real output price premium in the supermarket chain is unexpected, given that the supermarket buys only the high quality share of producers' production and given the costly transaction and post-harvest production standards required under the agreement.

Instead of an increase in mean price, we find that the Wal-Mart supply agreement represents a significant reduction in price risk to farmers used to selling in the traditional market system. Preliminary evidence, however, suggests that farmers may be overvaluing this decrease in downside risk. Estimates of relative risk coefficients using farmers' observed income, annual transaction quantities, and traditional and supermarket price series are extremely high, suggesting that the decrease in mean price that the farmers pay for the measure of price insurance in the contract is too high.

We also focused on the effects of a Nicaraguan farm household's being in a supply relationship with supermarkets. We found that geographic characteristics and natural resource endowments are significant predictors of a community's inclusion in a supermarket procurement basin.

Conditional on supply chain placement and instrumenting for supplier status, it is possible estimate

the impact of supplying a supermarket on participant farmer incomes, land accumulation, credit use, and assets. Estimates are of significant high positive impacts (on the order of a three to four fold increase in income) on farmer outcomes, significant to a number of robustness checks. We did not find that income impacts of participation increase with the tenure of the supply relationship. Nor does our preliminary analysis find significant impacts on land holdings, asset accumulation, or credit.

We used a lifecycle model to explain supermarket supply chain participation and exit patterns in Nicaraguan supermarket supply communities. The hypothesis was that farmers learn about the profitability of a new marketing channel relative to the traditional market both from their neighbors' accumulating experience and from their neighbors' exit. The research incorporated own experience, own exit, neighbors' experience, and neighbors' exit from supermarket supply chains into a conditional model to test whether a farmer's observation of these variables influence his or her decision to participate in subsequent periods. We also used this model to estimate whether some farmers pay a price for experimentation with the new market opportunity.

Results estimating the likelihood of participation in supermarket supply chains among Nicaraguan farmers suggest that the neighbors' exits from the supermarket supply chain are significant negative influences on a farmer's own decision to participate in the new market. The neighbors' accumulating experience in the supply chain is a significant positive determinant of farmer's participation.

However, observing a neighbor's exit is a significantly more powerful signal than observing another year of a neighbor's experience; this signal is significantly more powerful still for farmers who are in the channel themselves rather than those that have not yet entered the supply chain.

Finally, evidence of strategic delay on the part of farmers suggests the influence of a social process rather than a firm-level roll out of new contracts within a given village.

CONTRACTING OUT OF POVERTY IN PERU: EXPERIMENTAL APPROACHES

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http://www.basis.wisc.edu/projects_ama/contract_farming.html

Poor, rural farmers are often left out of the market. They may not be able to compete with larger farmers who can provide exporters and consistently high quality product. While some of these problems stem from scale, their inability to commit to a contract is also problematic. The proposed research will test contract designs in the field to show which structures work, and will measure improvements to overall farmer welfare based on their participation in a contract.

The research aims to help in the design of new institutional mechanisms that will favor the inclusion of smallholders and link them to dynamic markets through efficient contract farming arrangements. By working on refining these mechanisms, researchers will help integrate small farmers into higher value export markets and rapidly changing value chains. Participating in these markets will improve the welfare of the poor, and increase their income generating options. We propose to integrate small farmers into markets by designing contract mechanisms that are incentive-compatible. As a result we expect to improve the welfare of small farmers and improve profits of the firm. We expect the results from the implemented contracts to be applicable to contract farming in other developing countries.

Additional support

International Food Policy Research Institute: $43,266 per year.

Collaborations

IFPRI has an extensive research program on contract farming, which will benefit from our project results. Another IFPRI research team is implementing and evaluating existing contract designs in high-value crops in Indonesia, India and China, and with milk producers in Tanzania and Vietnam. The goal is to identify existing bottlenecks in existing contract designs with small holders. Results from our project in Peru will provide useful inputs for future contract recommendations and possible new contract designs.

Through IFPRI, we worked with the Multilateral Investment Fund of the Inter-American Development Bank (IADB) to launch a US$2 million technical assistance grant in support of private sector initiatives to reduce rural poverty and promote development. This grant fund will increase economic opportunities for the rural poor through the development of innovative cost-effective and private sector initiatives linking smallholder farmers to dynamic markets using contract farming arrangements. This initiative is being implemented in Guatemala, El Salvador, and Nicaragua. IFPRI will be involved in the impact evaluation of the selected interventions and in proposing innovative ways for improved contract arrangements. This opens a significant opportunity to use what we learn from our AMA-funded project to include in the criteria of the competitive grant process.

Outputs

A report on the market conditions and viability of working with the coffee cooperative, banana cooperative, and mango firm. A PowerPoint presentation that reports baseline and follow-up survey results.

ACTIVITIES

Our baseline survey of more than 400 farmers includes information on production activities, household characteristics, and experimental data on risk preferences. A follow-up survey with the farmers from our baseline collected detailed information on input use during the mango growing season, details of the contract that the household was offered and selected into, how the contract was executed, harvesting information, prices of transactions, problems faced, the evolution of production of the different qualities of mangoes, and mango sales. In-depth interviews with producers helped identify major problems they faced during the mango-growing season and with the mango company. We interviewed the staff of the mango firm with which we worked, and that information allowed us to test the impact of the contract design on input use and farmer profit.

A mango farmer in Peru. The AMA projects works with mango farmers to test if incentive contracts directly with a mango firm can improve farmer welfare while also proving to be profitable for the firm.

The mango firm gave us data on the firm's purchased production and purchase prices for the four recent growing seasons. We cross checked these data with data collected from farmers. This allowed us to analyze the distribution of contracts across the population of farmers, giving us a better understanding of the incentives behind the firm's behavior.

In the past year we began exploring new artefactual field experiments we could apply during the growing season. These experiments are related to the labor-leisure trade-off and to market design and trust.

In consultation with the firm, we designed new contracts that the firm implemented in the field with farmers during the 2008-2009 season. The contracts used price incentives to increase production of high-quality mango and offered credit to help farmers buy inputs to increase quantity of production. We did not implement new contracts in the field. Instead, during this past year, we spoke with several firms about implementing contracts for the 2010-2011 season. Our one agreement with a firm to experimentally implement contracts fell through when the firm decided against implementing contracts. Because of the difficulty we have had finding firms with whom we can implement new contracts, we decided to bypass the firms and work in the market directly. We are currently working with a financial institution (IDESI) to offer credit directly to mango farmers who were in our baseline survey. The idea is to relax the credit constraint for farmers through outside credit to see how that affects the contractual relationship, prices received and farmer profit.

Our survey has an innovative technique to include differences in gender in reporting information. Specifically, we developed surveys with a questionnaire to be answered separately by the household head (male/female) and by spouse (male/female). We tested this in previous surveys implemented in Peru using pairs of survey takers (male-female). We concluded there is a significant improvement in data quality by using two questionnaires (one for males and one for females) and by using interviewers of the same gender.

We have implemented two contract designs. Offering credit through IDESI allows us to see how relaxing the credit constraint effects farmer welfare. Firms often offer credit to farmers that is tied to the contract. Our approach allows us to examine the importance of credit to the ability of farmers to get better prices for their product, without having to include credit in the contract itself.

FINDINGS

We conducted two rounds of surveys with over 400 farmers in Piura and Lambayeque in northern Peru. The farms are all located with reasonable access to roads and markets. These farms are not isolated. Yet they are small (average 5.5 ha) and poor but not in extreme poverty (average of 6,591 soles per year). Most households also engage in livestock production in addition to agricultural production, but livestock production makes up a small portion of overall production (only 6%). The majority of households are headed by men, and the average age of the household head is 57 years old.

The farmers in our baseline survey sample sell frequently to the mango firm with which we work. About half the farmers sold at least twice to the firm in the past three years. Even so, distribution of production among suppliers is highly skewed, with the ten largest farmers providing roughly 40% of purchased production. Because of weather risk and large fluctuations in international prices, farmers in our sample face a high degree of price variation across years and producers. Average prices were 50% higher from 2006 to 2007 and then 33% lower the following year. Mango farming is very risky.

A top-quality mango could be sold to European markets for roughly 4£/mango, and a low-quality mango is typically cut up, frozen and used in manufacturing fruit drinks. Higher-quality mangos typically receive higher prices, but with the price variability, the same mango may receive high-quality prices one year and low-quality prices the next. There is no standard of quality that remains constant across seasons but rather is dependent on the supply of mangos in the market. Due to unstable international prices, the firm adjusts the prices it offers by quality and the quality standard. Farmers do not know from year to year what will be considered high quality and what prices they will get for their product. Needless to say, farmers find these practices frustrating.

A long-term relationship with the firm has a monetary return to the farmer. Farmers who have traded with the firm for a longer period of time tend to get higher prices for their mangos. We found evidence of the value of long-term relationships. Farmers are more likely to get help, as with inputs and credit. Farmers get help in bad years but lower prices in good years. This provides stability of income and provides more risk averse farmers with assurance.

Firms also benefit. They can buy on credit and can pick the produce they want to buy, usually therefore getting the highest quality. We have yet to develop information on firm profit—whether they do build better profits through these contractual arrangements. Also we found evidence that firms are moving away from offering contracts with small producers, do not seem to be paying significantly higher prices, and that they pay out late.

Our experimental contract design included credit from the local credit union (backed by the firm) and a price incentive for an increase in production of first-quality mango. Contracts were to be randomly assigned to farmers, in order to measure the impact of the contract apart from contract selection. There were challenges in the implementation of the contract because the credit union was late or did not deliver the credit to farmers in time to make a difference in production. Given these challenges, the contracts were not necessarily implemented as originally designed. Nonetheless, we have checked the data, and our control and treatment groups are similar in terms of observable characteristics and risk preferences.

The contract design did work. Credit/inputs can have a large impact on the livelihood of farmers, and farmers in our treatment group received more inputs or financial assistance from the mango firm. The benefits of being in a long-term relationship also include receiving higher prices for production. Most importantly, the contract design improved farmer retention with the firm. Farmers who received the treatment contracts (credit and price incentives) sold a greater proportion of their production to the mango firm.

ENHANCING SMALLHOLDER COMPETITIVENESS IN THE FACE OF GLOBALIZATION (GUATEMALA)

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http://www.basis.wisc.edu/projects_ama/enhancing_smallholder_competitiveness.htm

Smallholder farming has been the institutional structure for some of the most effective historical contributions of agriculture to economic development. Yet, this very social structure is under threat as globalization, trade liberalization, and the development of integrated value chains for food progresses. Guatemala has an unusually large smallholder sector with a strong indigenous base engaged in labor-intensive non-traditional exports. Coffee is in many ways a bellwether for smallholder farmers, because it already features the steep price/quality gradient that is emerging in other micro-vegetable production.

This project analyzes three institutional innovations with potential of increasing the competitiveness of the smallholder sector: fair trade, the linking of insurance to credit, and the use of credit bureaus in microfinance lending. Guatemala has an unusually large smallholder sector with a strong indigenous base engaged in labor intensive non-traditional exports. It is an excellent natural laboratory since it combines widespread smallholder farming with a rapidly-growing high value export sector.

In all cases, the project combines sound identification strategies with the use of administrative data, and collaboration with the private sector. Results provide an unusual combination of benefits: opportunities for collaborating institutions (including fair trade agencies, producer cooperatives and microfinance lenders) to improve their products and provide information for policymakers to improve policy design, and training opportunities for students in Guatemala and the United States.

Outputs

BASIS Brief no. 2010-10. “Creating Incentives to Save among Microfinance Borrowers: A Behavioral Experiment from Guatemala,” by Jesse Atkinson, Alain de Janvry, Craig McIntosh, and Elisabeth Sadoulet.

BASIS Brief no. 2010-08. “Fair Trade and Free Entry: Examining Producer Benefits,” by Alain de Janvry, Craig McIntosh, and Elisabeth Sadoulet.

BASIS Brief no. 2007-04. “Enhancing Smallholder Competitiveness in the Face of Globalization,” by Alain de Janvry, Elisabeth Sadoulet, Craig McIntosh and Tomas Rosada.

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Luna, Kira. 2008. Selling on the Side: A Look at Selling Practices within Guatemalan Fair Trade Coffee Cooperatives.”

McIntosh, Craig. “Offering Commitment Savings Products to Current Microfinance Borrowers.” PowerPoint presentation.

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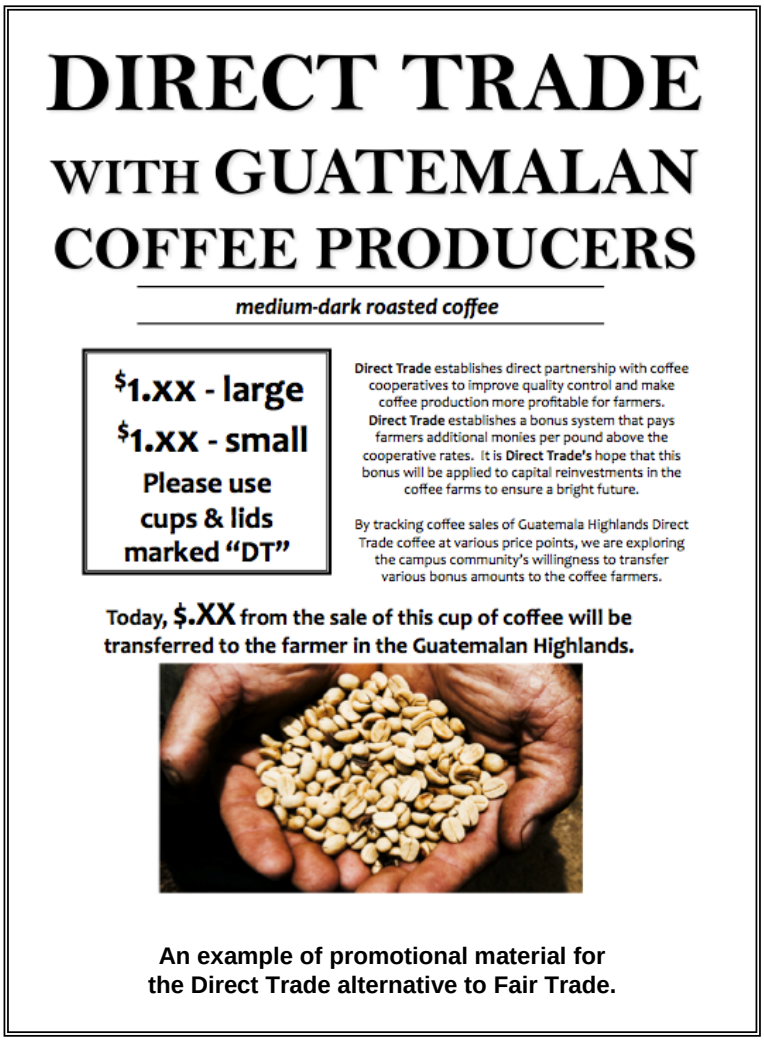
Sanborn, Rebecca. “Fair Trade Coffee Production in Guatemala.” Report produced for the University of California, San Diego.

In collaboration with CHN, we produced material that explains to clients the principle of savings and the different products.

ACTIVITIES

We explored the nature of the contracts in the coffee market in several related ways. First, we used rich sources of institutional data to analyze quality, price, and Fair Trade (FT) premia in the largest second-tier cooperative in Guatemala. Second, we conducted a detailed field survey of coffee producing cooperatives in the country, and intersected it with the institutional data to get an unprecedented view of the complex forward contracts that serve both as credit and insurance in these markets. FT demand was also analyzed in terms of consumer demand in the United States.

On the side of financial institutions, we looked for ways to expand access to formal financial services among rural populations. Drawing on new theoretical insights to highlight the importance of the provision of commitment savings products, we worked with the microfinance sector of the largest public bank in Guatemala to provide its clients an opportunity to commit to save following a plan they set for themselves.



An example of promotional material for the Direct Trade alternative to Fair Trade.

FINDINGS

Estimating the effective Fair Trade premium received by producers. We completed this project, which analyzed the Fair Trade (FT) premium effectively received by coffee producers. The analysis is based on institutional data of *Fedecocagua*, covering 10 years of sales (1997-2006) of FT, non-FT, and organic coffee. This database includes the quality, price, quantity, and timing of delivery of all coffee that moves through *Fedecocagua*.

The period analyzed include a long stretch of very low international coffee price and a few years of high international prices. This allowed us to analyze the effective FT premium under these two very different conditions. Our analysis suggests that over-certification dilutes the effective premium even during years in which the nominal FT premium is high. Then, the use of a quality-invariant FT floor price in the very heterogeneous market for coffee creates a second, completely unrelated mechanism through which producer benefit is eroded.

We found that, while the nominal FT price premium was up to 60¢/lb. at the worst of the coffee crisis, the effective premium at that time was only about 10¢/lb. once adjustments were made for over certification and unrewarded quality. Over the 13-year period for which sales were observed, the average NY "C" market price was $1.07/lb. Subtracting a conservative certification cost of 3¢/lb., the adjusted FT premium over the period was 1.6¢/lb. Over the last five years, the premium was negative, equal to –1.2¢/lb. Once rent dissipation mechanisms have been taken into account, it appears that FT price premiums have been very close to zero.

We can assess the welfare value of these economic impacts by combining them to the sales and revenues of a typical Guatemalan coffee farmer. To do this, we use the 2006 *Encuesta Nacional de Condiciones de Vida*, a nationally representative household survey.

Among coffee producing households, median coffee sales for that year were 910 pounds of parchment coffee, which corresponds to roughly 725 pounds of green coffee. This means that if the whole FT average effective transfer of 1.6¢/lb. were transferred through to producers (a big if), the producer's income would have increased by about $11 over the course of a year, relative to a median reported coffee sales value of $206.

However, these data also suggest that producers receive around 28¢/lb. in a year where the NY'C' was just over a dollar, so if an analogous share of the FT premium is passed through, this average annual benefit would fall to $3. Taking the actual 2006 effective premium of –0.5 cents, the median farmer would have lost about $3.65 by participating in FT that particular year.

The price premium that Fair Trade has been able to generate for coffee producers appears to be very close to zero.

Savings innovations in Credito Hypotecario Nacional *(CHN).* The research project with CHN, the country's largest public bank, on alternative ways to build liquidity among Guatemala's poor entrepreneurs, was successfully implemented for three months. However, as the financial crisis hit Guatemala in October 2008, all lending activities were frozen. As a consequence, we had to modify the research strategy.

This experiment utilized recent insights from behavioral economics to design products that foster the rapid and sustainable formation of savings among CHN's microfinance portfolio. This question is of policy interest because of the long-understood importance of savings balances as a vehicle out of poverty for entrepreneurial households. Also, the need has gained greater impetus within the last year because of the collapse of external financing for the microfinance sector, leading lenders to focus on internal savings as a source of loan liquidity.

The research design had a control group and two treatment arms. In the control, called Basic Savings, borrowers taking new microfinance loans were given promotional material on the value of savings, and then the chance to open a new savings account.

In "Open Treatment," new borrowers were given the same promotion material but were also offered the opportunity to set a "commitment savings" amount, a deposit that they would be prompted to make every month when their loan payment was made (although there are no repercussions for their not doing so).

In "Default Treatment," new borrowers were given the promotion material and told that by default they would have a new account opened for them with a savings contribution totaling 10% of the loan, although they were free to opt out of the program.

The treatments were randomized across the 32 branches of CHN, with more than 2,000 borrowers taking new loans within the experimental window. The results were striking. As the figure (next page) shows, encouraging borrowers to save an amount that they chose (Open Treatment) induced a very large increase in their savings accumulation. Furthermore, the simple suggestion that a possible saving rate could be 10% of monthly loan payment induced an even higher savings accumulation. The savings promotion was powerful in inducing clients to open a savings account—40% of them did so in the Basic Savings and Open Treatment. The Default Treatment raised that number to almost 80%. Conditional on having opened an account, the commitment with reminders induced 75% of the clients to use their account at least once, compared to only 33% in the control group.

Combining these results shows that 13.5% of the microfinance clients had an active savings account in the Basic Savings promotion group, 33.5% in Open Treatment, and 58.5% in Default Treatment. Deposits were most often within a small range of the committed amounts, and median savings reached the goals savers had set for themselves in Open Treatment, while missing by less than 20% of their larger goal in the Default Treatment.

Activities on the savings accounts also show numerous withdrawals, particularly in the Default Treatment. After 16 months of observation, net accumulated savings for those who opened an account was $14 in the Basic Savings group, and about $29 in the Open and Default Treatments. Including the non-savers, the Open Treatment raised the average savings from $5.6 to $12.6, and the Default Treatment to $22.6. On balance, then, these results suggest that a widespread implementation of the 10% Default Savings product was likely to lead to large increases in savings balances in the organization. We uncovered no evidence that these larger savings balances in any way damage loan repayment; if anything the reverse was true.

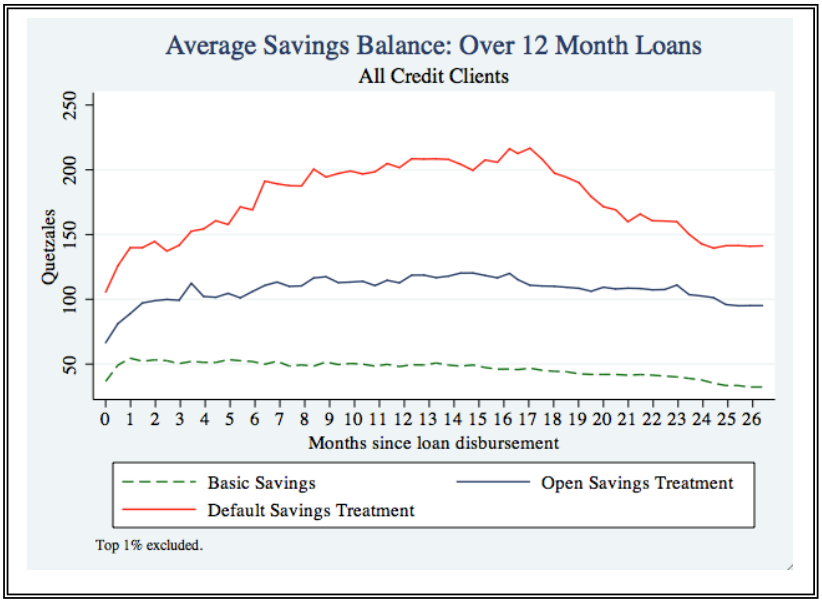
Results from this experiment were very well received by CHN, because they represent scalable commitment savings products that can be implemented at almost no cost to the bank.

Consumer demand for Fair Trade coffee. The purpose of this research was to verify and quantify the demand for FT coffee, by designing a set of consumer experiments in which the benefit to producers is labeled explicitly. The main experiments were to measure how the demand for FT coffee was affected by varying information and prices of FT coffee, and what would be the demand for a higher direct transfer to the farmers.

Implementing the experiment turned out to be far more difficult than expected. The first step was to identify an importer in the United States from whom we could purchase coffee that was both FT certified and with a very clear identification of the cooperative of origin.

In the Berkeley area, we tried to implement the experiment in a couple of high-end supermarket stores, but failed to get an agreement with the managers. We then approached many smaller stores; while we could get some to agree, we failed to get enough of them and most have sales volume that are too small to result in a meaningful statistical analysis. We then approached coffee shops that sell brewed coffee in cups. Although we tried different contexts, it appeared quickly that whenever the cashier had to ask which coffee customer wanted, either social pressure was too high (in a campus context), or the cashier could not maintain the experiment in busy hours, or the choice was based on the residual tips (in an off-campus environment).

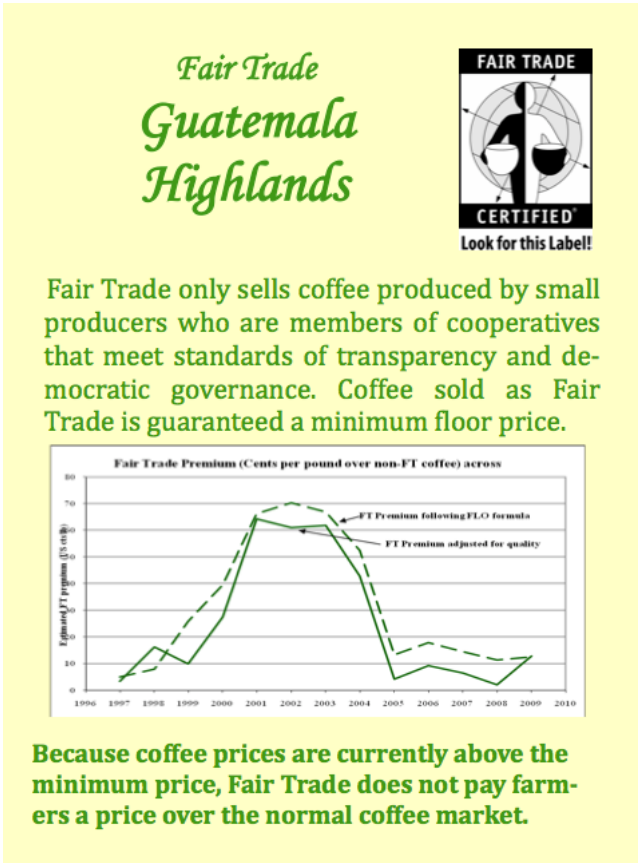
After months of failed experiments, we settled on alternative experiments. One is on the sale of bags, with an experiment over several months in a high-end roaster that has a program of direct trade. This experiment is ongoing. Another uses two self-serve cafeterias on the Berkeley campus and experiments with daily changes of price.



We also conducted two experiments at UC San Diego on the determinants of FT coffee demand. The first was performed in early 2010 at a coffee house, and involved randomizing the labeling of cups of coffee. This experiment demonstrated primarily that there was an almost total insensitivity of cupped coffee demand to information provided to consumers.

We then performed our next project in an environment where most coffee is purchased in bags, hoping that consumers would take in more information about the coffee in this environment. This environment also allowed us to inject as wide a range as possible of price variation into the experiment. Working with an independent coffee shop that procures most of its coffee directly from the source and roasts in-house, we have been much more successful. This experiment was slated to continue at least through the end of 2010.

Early results show a significant increase in demand when a specific coffee switches to be labeled as FT. Yet demand is relatively insensitive to labeling variations once the FT label is displayed—for example, adding information indicating that FT producers do not benefit financially because the world coffee price is above the FT floor. Most interestingly, we have evidence that FT consumers are in fact quite price sensitive, contrary to results from another 2008 study that found that FT coffee demand is completely price inelastic.



Does the label influence demand? On two university campuses, we carried out an experiment that presented information about Fair Trade coffee and the premium transferred to coffee producers. The goal was to measure whether providing such information increased demand for the coffee. We found a significant increase in demand when a FT label was used, and yet changing the information included on the label had little added effect on demand.

We will continue with experiments comparing Direct Trade demand to FT demand, and how the response to price variation changes when consumers are told that the entire price increment is being passed through to the producer as profit.

SAVINGS, SUBSIDIES, AND SUSTAINABLE FOOD SECURITY IN MOZAMBIQUE

Principal Investigators

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http://www.basis.wisc.edu/projects_ama/Savings_Subsidies_Food_Security_Mozambique.html

What are the short and long run impacts of fertilizer subsidies on smallholder farmers? Do subsidies have greater long-run impacts when they are provided in combination with savings facilities? Are savings matches effective at motivating farmers to begin saving, and do farmers continue saving on their own once matches end? How do group-based incentives for savings differ in their effects from individual-based incentives? This research seeks to shed light on these questions using a field experiment among farmers in rural Mozambique. Vouchers for fertilizer were distributed in a randomized fashion to a sample of farmers in rural Mozambique. In partnership with a local financial institution, we will randomize offers of savings accounts to farmers. Some savings accounts will be ordinary accounts with standard interest rates, while others will be matched savings accounts with match rates of 50%. A random lottery will be used to determine the specific savings intervention offered to each farmer group.

Several sub-Saharan African countries have implemented large-scale fertilizer subsidy programs in an attempt to boost the productivity and food security of small farmers. With the recent global escalation in food prices, other countries in Africa and around the world are considering similar fertilizer subsidies. This is a key moment to quantify the short-term impacts such programs have on farm output, and also to investigate if there are ways to ensure that longer-term impacts endure after subsidies are phased out. Do farmers continue to invest in and utilize the improved technologies and the higher-yield inputs that were available to them under subsidies? The key to determining whether provision of subsidies leads to long-term growth, even after the subsidies are no longer in effect, is to discover if farmer practices change fundamentally or whether these practices change only in direct reaction to the availability of subsidies.

The recent implementation of a program that provides input support to smallholder farmers in rural Mozambique offers BASIS the opportunity to examine whether household wellbeing improves under subsidies, and if this improvement can be made sustainable. BASIS researchers are implementing a field experiment among farmers in the program's target regions that will result in recommendations to help make this and similar programs more effective in improving household consumption over the long term, as well as revealing alternative approaches to subsidizing farmers that might prove more effective in improving farmer knowledge, practices and output. Importantly, the BASIS research also looks at whether providing farmers opportunities for savings plans through a local financial provider will help subsidies achieve a greater sustainable impact.

Collaborations

The International Fertilizer Development Center (IFDC) works in close partnership with the University of Michigan. IFDC Mozambique provided their agricultural expertise, contributed to the completion of the randomization of the agro-input subsidy and banking services, and to the implementation of the surveys.

Banco Oportunidade de Mocambique (from Opportunity International) is the local provider of banking services and financial trainings.

The project evaluates an agro-input subsidy program funded by the European Union and implemented by the Ministry of Agriculture of Mozambique, the FAO, and IFDC.

Outputs

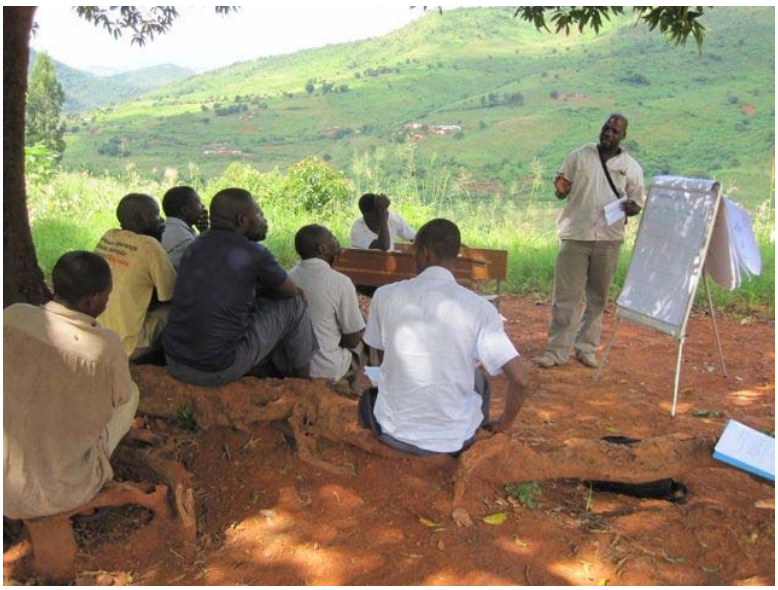
BASIS Brief no. 2010-02. "Savings, Subsidies and Sustainable Food Security in Mozambique," by Michael R. Carter, Rachid Laajaj and Dean Yang.

BASIS Brief no. 2010-04. "Subsidies and the consequences of drought: a Field Report," By Rachid Laajaj and Aniceto Da Fonseca Matias.

ACTIVITIES

At the request of Mozambique's Ministry of Agriculture and the Food and Agriculture Organization (FAO), the International Fertilizer Development Center (IFDC) is implementing an agro-input subsidy program in Mozambique. Funded by the European Union, the program provides vouchers to targeted smallholder farmers, who are then entitled to receive a package of inputs at subsidized rates sufficient for half a hectare of land. The goal is to promote the long-term use of fertilizer and improved seed varieties.

BASIS arranged to have vouchers distributed in a randomized fashion to a sample of farmers. In partnership with a local financial institution, Banco Oportunidade de Mocambique (BOM), BASIS researchers also randomized access to banking services. A lottery determines the specific savings intervention offered to each farmer. To avoid potential complications that might arise if individuals in a village are offered different match rates, randomization is carried out at the village level.



During a focus group in Chua, the matched savings program is explained to the farmers. Photo by Rachid Laajaj.

The research team intended to implement the evaluation using a sample of 2000 farmers. A baseline survey was to be administered in April 2010, after distribution of vouchers but prior to harvest and the farmers receiving banking education.

However, the four districts in the province of Manica, where the voucher project takes place, received between 0-20% of normal rainfall during the first half of January 2010, marking the persistence of a drought that started in December 2009. After visiting the fields in the four districts, the research team observed that expected production was below 60% of an average year for farmers with no irrigation, and the benefits of fertilizer were severely diminished. (See **BASIS Brief 2010-2** for the field report of the drought.) Therefore, the team concluded that it would be inappropriate to ask farmers to start saving during this lean period, and we decided to delay the full-scale project for one year.

Meanwhile, we implemented a pilot project to test the matched savings innovation over a smaller subsample. The baseline pilot survey was run in April and May 2010 and immediately followed by training for 220 farmers on the benefits of fertilizer and savings accounts. This training provided basic skills to help farmers decide whether an investment was valuable to them. After this, in order to receive the matched savings, farmers

Lists of participants in the pilot were made immediately after the explanation of the program. Photo by Rachid Laajaj.

were given a few months to open an account and start saving until the time to purchase agro-inputs.

Implementing a pilot was an unexpected consequence of the drought, yet it turned into a valuable learning experience. We recruited a team manager and made connections with all the public and private actors responsible for the technical assistance and provision of agro-inputs. We also designed and implemented a training program to encourage the use of fertilizer and savings among small farmers. Within the BOM we were able to develop the capacity to carry out the program. We also tested the questionnaire with 361 farmers, which helped us improve and select the questions for the full-scale survey.

Our new research design is the result of the lessons learned during the pilot. After testing individual and group match savings in the pilot and finding out that, for statistical reasons, it would be difficult to implement more than three savings treatment, we dropped group matched savings from the full-scale project and focused on the three most important issues: the impact of agricultural subsidies, the impact of matched savings, and the complementarity between the two interventions. For each, we will look at the impact on the use of agro-inputs, agricultural production, savings and welfare indicators, in the short and medium run.

A field with relatively thin maize plants and low production caused by insufficient rainfall, despite the use of fertilizer. Photo by Rachid Laajaj.

FINDINGS

The pilot project experimented with two types of savings matches. Both required the beneficiaries to save for a minimum period of three months. Bonuses were calculated based on the minimum savings over the three-month period. A total of 183 beneficiaries had access to individual matched savings (IMS), which offers a bonus of 50% of the person's savings. A total of 178 beneficiaries had access to the group matched savings (GMS), which offers a bonus of 25% of the persons' savings plus 25% of the average savings of the farmer's group.

Unexpectedly, farmers showed a preference for IMS during the focus groups, arguing that, with the GMS, part of the benefits of one's efforts to save goes to others in the group. Also, GMS is more difficult to understand. Farmers, however, did halfheartedly admit that one of the benefits of GMS is to learn from and encourage one another.

Field severely affected by the drought, which motivated the delay of the full-scale project. Photo by Rachid Laajaj.

The results in terms of savings were mixed. Slightly more farmers opened a savings account with GMS (21.5%) than with IMS (19%), but the savings, conditional on opening an account, were 33% higher among those with IMS. Interestingly GMS is more inclusive, but IMS encourages a higher level of savings. None of these effects was statistically significant in the pilot project.

The explanation of the bonus of the matched savings immediately attracted the interest of the farmers, who claimed to want a savings account. Yet, out of the 361 farmers offered a matched savings, only 75 of them (21%) opened a savings account. After frequent visits to the field and discussions with the beneficiaries, our team identified the following obstacles, to be addressed in the full-scale project:

- Only a few farmers have a *Bilhete de identidade* (an ID), which was required by the bank to open a savings account. During the upcoming season, the bank will allow clients to open an account with their electoral card, which are much more commonly held by rural residents.
- In a region with high communications costs, any unnecessary complication must be avoided. The pilot offered each farmer the choice among three possible three-month periods (with a one-month interval between each period) in order to offer more flexibility; yet this brought more confusion than benefits, both on the side of the participants and for the bank to calculate and distribute the bonuses. The implementation of the GMS also suffered from being imperfectly grasped by the farmers.
- Trust was a major issue. Some farmers worried that the bank we partnered with was not well known, and some felt that the purpose of the project was purely commercial. More importantly, many doubted that they would ever receive the bonus of the matched savings. To build trust in the coming year, we might extend the program to two years instead of one. We also will build in more and improved communication. Farmers expressed a strong satisfaction after receiving their bonus, and we can build on their experience to help convince other farmers of the merits and trustworthiness of the project.
- Follow up is essential. Despite the strong economic incentive of the matched savings, a one-shot intervention is not enough to convince farmers unfamiliar with the banking system to deal with the financial world. We are discussing with the bank ways to keep regular contact with the beneficiaries during the entire period in order to build trust and increase financial knowledge and savings habits.

IMPACT OF BUSINESS SERVICES ON THE ECONOMIC WELLBEING OF FARMERS IN NICARAGUA

Principal Investigators

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http://www.basis.wisc.edu/projects_ama/MCC_Nicaragua_Impact_Evaluation.html

The Millennium Challenge Corporation (MCC) is working with MCA-Nicaragua to implement at $175 million compact to support economic growth through property regularization, infrastructure improvement and rural business development. The AMA CRSP was contract to aid in the impact evaluation to assess the extent to which the income of the beneficiaries was increased as a result of the program. The projects being analyzed include the benefits of road upgrading, and the benefit to both rural and urban households as a result of property regularization. AMA CRSP researchers have helped develop the methodology for the impact evaluation, including survey design, and have been actively involved in sampling and oversight of data collection.

Outputs

BASIS Brief no. 2010-01. "Impact of Business Services on the Economic Wellbeing of Small Farmers in Nicaragua," by Patricia E. Toledo and Michael R. Carter.

BASIS Brief no. 2010-01-S. "Impacto de servicios para el desarrollo de negocios rurales en el bienestar económico de productores en Nicaragua," by Patricia E. Toledo and Michael R. Carter.

ACTIVITIES

Low levels of education, lack of access to credit and technology, insecure property titles, poor infrastructure—constraints such as these are typical of rural areas in most developing countries, particularly in the agricultural sector. Implementing development strategies to eliminate or ease these constraints can help farmers realize a greater productive potential. In 2005, the Nicaraguan government, in cooperation with the Millennium Challenge Corporation (MCC), devised a rural economic growth and poverty reduction program for the high-potential Pacific coast departments of León and Chinandega. The program had three components: construction and/or rehabilitation of 74 kilometers of highway and rural secondary roads; provision of legally secure titles for landowners by mapping properties, resolving disputes, improving documentation, and land registry capacity building; and, provision of rural business development services, including technical and financial assistance and providing improved market information and linkages. This brief focuses on the direct impacts of this third component, the rural business development (RBD) project.

How well have RBD services worked thus far, and for whom? This brief reports results from the mid-point of a four-year impact evaluation of the RBD project, carried out by a team from the Universities of Wisconsin and California. Using survey data and a randomized rollout strategy, the team's chief findings show that the average increase in RBD household incomes is small (3% more than the change in control household income) and not statistically different from zero. However, this average effect is somewhat misleading. When more general analytical methods are used, they reveal that the top performing RBD households experience income increases that are statistically significant and are some 10% higher than the increases experienced by similarly high performing control group households. The impact study will continue to follow these groups, and future analysis will reveal whether impacts will grow and spread more broadly across the RBD participant population.

MCC's rural business development project supported installation of milk collection centers and promoted improved sanitary practices for dairy producers. Here a group of project participants gather with officials from MCA-Nicaragua. ***Photo by MCA-Nicaragua, used by permission.***

The Nicaragua-MCC compact

After the Nicaraguan government presented its regional rural development proposal to MCC, an intensive consultative process led to the signing of one of the first MCC compacts and agreement on a multi-faceted program to help raise incomes for farmers and other rural business people. A Nicaraguan entity, the Millennium Challenge Account (MCA-Nicaragua), was established to fund and implement the program. The goal of MCA-Nicaragua is to boost the productive capacity in the departments of León and Chinandega, the country's rural "breadbasket," which has proven growth potential due to its fertile land and connection to international markets.

The compact identified low-value rural business and farm activities as a major constraint to economic

growth, and the RBD project was established to confront this problem. In conjunction with this project, MCA-Nicaragua planned to implement a property regularization project designed to decrease the cost of land transactions and increase tenure security. In isolation, evidence of positive impacts from property programs is mixed. MCA's strategy of combining a study of the impacts of property regularization with the impacts of business services was a novel way of trying to determine what mixture of projects has the greatest chance of improving incomes for rural producers. However, while the Nicaraguan government continues to implement the property registration project, MCA's involvement in that component was cancelled. Therefore, the initial evaluation results reported here do not include analysis of titling impacts.

Even with the property regularization project canceled, MCA expects that RBD will train approximately 10,000 rural people—primarily farmers, but also artisans and other rural business people—in a variety of technical areas. As a result of thousands of people transitioning into higher-value agriculture, MCA projects that the additional profits and wages could total US$30 million annually, beginning six years after RBD's launch in 2007.

Is this bold projection being met? To answer this question, a comprehensive impact evaluation was designed to evaluate the experience of agricultural and livestock producers who participate in the RBD project. By comparing differences between "treated" households (those eligible to participate in the project from the beginning) and "control" households (those eligible for the project, but whose participation was delayed by the rollout calendar), the impact evaluation can determine the extent to which providing business services improves the economic wellbeing of households beyond what it would be in the absence of such services. As this brief will show, the evaluation also provides a picture of the types of households that benefit most from the RBD project.

Eligibility and implementation

To be eligible for RBD services, a producer must run a small- or medium-sized farming or livestock operation. To operationalize this concept, MCA established eligibility criteria that varied based on a farmer's sphere of economic activity. The box lists criteria for livestock producers. For example, operations that are either too large (more than 100 cows), or too small (fewer than 10 cows) are ineligible for RBD services.

The logic for the eligibility ceiling is obvious, as the MCA project was not intended to subsidize the activities of well-positioned rural producers who are less likely to face the constraints that confront the less well off, including uncertain land ownership, poor access to financial services, weak entrepreneurial and technological skills, and tenuous links to markets. The eligibility floor, and where it should be set, is more controversial and is an issue that confronts rural development projects the world over. The imposition of a floor is meant to assure that all eligible farmers operate at a minimum scale needed to be successful and to justify on-farm investments, yet a higher floor also excludes less well-off households from direct project benefit. The impact evaluation opens a window into the implications of these eligibility criteria.

In 2007, the RBD project began with a massive campaign to attract participation. Offices were opened in the main regional cities of León and Chinandega, where farmers could learn about the project and volunteer to take part. As the project was being advertised throughout the two departments, coordinators chose areas where agro-climatic and other conditions favored the development of specific types of businesses. The coordinators then identified farmers engaged in the same type of productive activity, first focusing on livestock, bean, sesame and cassava, since these represented MCA's most important target areas. Given the interest shown by farmers in other crops, the project was extended to products such as plantain, rice, honey and fruit. Farmers engaged in the same type of productive activity and in geographic proximity were listed as "clusters" of producers, all eligible for business services under the stated criteria for that activity.

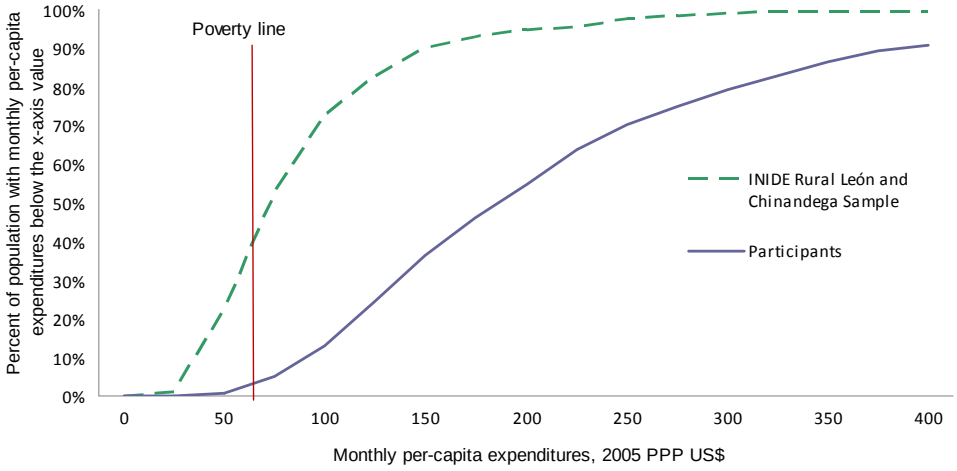
Within each cluster, those who chose to participate in the project formed a "nucleus" of producers. For each nucleus, a lead farmer was designated, with the other participants in that production cluster considered "satellite farmers." The lead farmer had to be willing to invest more in his or her operation than the satellite farmers invest in theirs, for example allocating some land for a milk collection center to be used by all members of the nucleus. The lead farmer also must coordinate technical meetings with the satellite farmers. Given the importance of the leader's farm, satellite farms are in relative proximity.

Each member of the nucleus develops a business plan with the support of MCA professionals. After the business plan is approved, MCA works with participating farmers for 24 months. Project benefits depend on the productive activity; in general, all participating farmers receive technical and financial training, and supplies. If an investment is required, the project can provide up to 30% of the financial resources needed. In other cases, a commercialization network might be provided to some nuclei to improve distribution and marketing channels.

Data collected for the impact evaluation offer a sense of how the eligibility criteria shaped the targeting of the RBD project—that is, how effectively does the project target the poor population in León and Chinandega? According to a national living standards measurement survey carried out by the Instituto Nacional de Información de Desarrollo (INIDE), 34% of the rural population in León and Chinandega was under a standard $2 per-person, per-day poverty line in 2005. (This and all other figures in this brief are expressed in 2005 purchasing power parity adjusted US dollars, or PPP US$.) The income distribution for the INIDE rural León and Chinandega sample is presented as the dashed line in Figure 1.

How do those who participated in the RBD project compare to these figures? As shown by the solid line in Figure 1, only 2% of RBD participants were below the standard "$2-a-day" poverty line prior to initiation of the program. From the figure we can also see that the eligibility criteria effectively targeted direct benefits toward the upper 50% of the rural income distribution in León and Chinandega, with the median income of participants approximately US$6 a day. It may be that the lower 50% of people will benefit indirectly through job creation, but such an analysis is beyond the reach of the impact evaluation.

Figure 1. Targeting of the RBD Program



Evaluation strategy

The challenge of this and all impact evaluation efforts is to identify a control group that is identical to the treatment group in every way except that the controls have not benefited from the project. For the RBD project, the evaluation strategy exploited the fact that, due to capacity constraints, not all eligible farmers could be brought into the project immediately. After working with MCA to identify all the geographic clusters that eventually would be brought into the project, the evaluation team and the RBD office selected a subset of clusters for random assignment to either early or late treatment status. As shown in the timeline in Figure 2, RBD services were provided in early treatment clusters beginning in late 2007. In late treatment clusters, services were not initiated until approximately 18 months later, or early 2009. Because clusters were randomly allocated to early and late treatment status, we can anticipate that, on average, the late treatment group should function as a valid control group, identical, within a margin of

error, to the early group in every way except for the timing of the receipt of RBD services. Thus, the economic status of the late group at the time of the second-round survey in 2009 should be a good predictor of what the status of the early group would have been in the absence of RBD services.

Once the random assignment of early and late clusters was made, the impact evaluation team created a roster of all eligible producers in these clusters, and then randomly selected a sample of 1600 households split between early and late areas. These 1600 households were then invited to participate in the impact study, and they completed a baseline survey in late 2007, just as the RBD project was beginning in the early treatment clusters.

Within these clusters, approximately 65% of the eligible households chose to participate in the project. A second-round survey was applied to all 1600 households in the first quarter of 2009, just as the project was rolled out in the late treatment area (see the Figure 2 timeline). While it was not clear at the time of the baseline survey which of the eligible households in the late treatment areas would choose to participate in the project, those households had made their participation decision by the time of the second-round survey. Similar to the early treatment clusters, 63% of eligible households in late treatment clusters declared their intention to join the project at the time of the second-round survey in 2009. The analysis in this brief considers these households to be participants, although the most recent data found that some of these households ultimately did not join the project because of a change in eligibility criteria for bean farmers.

Because the timing of the surveys and project rollout allows for determination of farmer type in both early and late treatment areas (participants versus non-participants), the impact evaluation has the opportunity to study impacts on both *eligible* households (an intention to treat effect) as well as on *participating* households (treatment on the treated effect). Because the RBD project could not be instantaneously initiated in all early clusters, the amount of time that these cluster farmers had been receiving RBD services by the 2009 survey varied from six to 18 months, with most early treatment farmers receiving between 12 and 18 months of RBD service.

Figure 2. Timeline of early and late participants joining the project as compared to timing of survey rounds

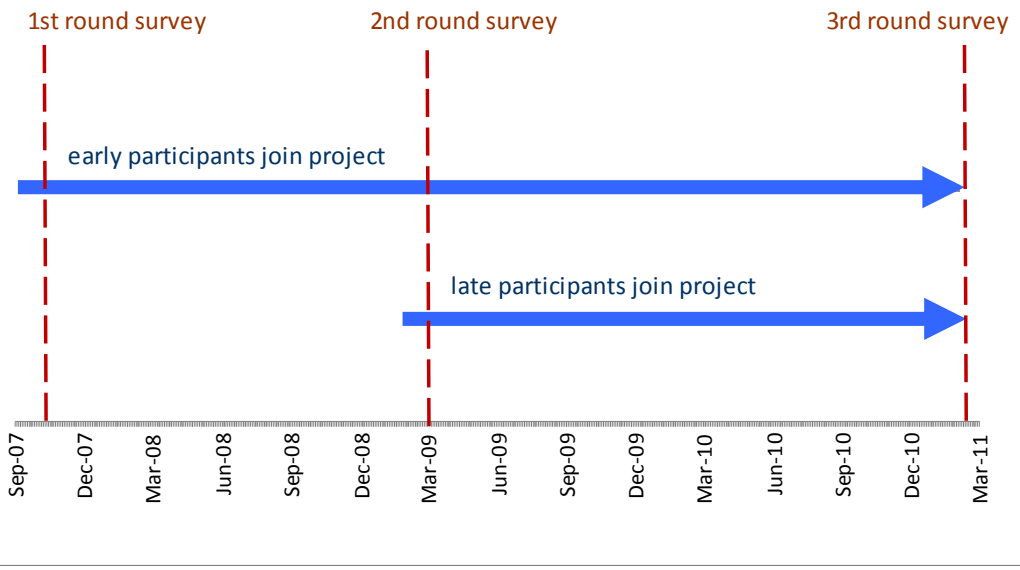


Table 1. Indicators from baseline survey (2007/2008)

Mean per-capita monthly expenditures (2005 PPP US$)

	Late treatment (those without business services until 2009)	Early treatment (those with business services starting 2007)
All eligible HHs	$206	$211
Participating HHs	$202	$211
Farm size (manzanas)	41.4 (median=20.0)	34.8 (median=20.0)
Farmer age (years)	52	50
Farmer education (years)	4	4

Table 2. Round two (2009) survey findings

Mean per-capita monthly expenditures (2005 PPP US$)

	Late treatment (those without business services until 2009)	Early treatment (those with business services starting 2007)
All eligible HHs	$221	$219
Participating HHs	$212	$225

Difference-in-difference estimates (2005 PPP US$)

	Total monthly expenditures	Per-capita monthly expenditures
All eligible HHs	$4 (0%)	$ -6 (-3%)
Participating HHs	$28 (3%)	$4 (2%)

The survey queried farmers about agricultural practices, marketing, and prices for their product. The survey also implemented a full consumer expenditure module, using the same questions employed by the INIDE living standards measurement survey used to gauge poverty rates in the region and the country as a whole. The results reported here rely on these expenditure measures. Total household expenditure, which should be the mirror image of household income (but is more easily measured), is the primary outcome variable of interest for the impact evaluation. Additional analysis will be undertaken to show the impact of RBD services on technology choices, marketing, and prices received.

As shown in Table 1, the randomization between early and late treatment areas worked well, giving confidence that the late treatment group is indeed a valid control group. According to the 2007 baseline survey, farm households located in communities randomly selected for early receipt of business services were statistically indistinguishable from households in communities slated for later rollout of the project. Prior to the start of the RBD project, mean per-capita and household expenditures per month for the early treatment group were almost identical to that of the late treatment group. Other characteristics (farm size, education levels, age, etc.) also showed no statistical difference between the early and late groups at baseline.

Impacts

The RBD project was hypothesized to increase annual rural household incomes and asset values by enough to justify project costs. Given the initial similarity of the early and late treatment groups, we could evaluate initial project impacts using the second-round survey data collected in February 2009. The top panel of Table 2 presents data on monthly per-capita expenditures for the different groups in the study (early versus late treatment, participants versus merely eligible farmers). As can be seen, all these figures are quite close to each other, and none of the differences between the groups is statistically significant. For example, mean per-capita monthly expenditure for RBD participant households in the early treatment groups is $225, whereas it is $212 for the non-treated participant households in the late treatment areas (figures again are measured in 2005 PPP US$).

While these numbers from the second round survey are indicative of project impact, we more precisely define project impact as the average increase in monthly per-capita expenditure by farmers who received business services minus the average increase over the same time period for those farmers who did not receive business services. Using this "difference-in-difference estimator," we find that, on average, participants' per-capita monthly expenditures increased by 4 PPP US$ more than did expenditures for those not yet participating in the project (see the lower panel of Table 2.) However, these difference-in-difference impacts—which imply about a 2% improvement in the economic wellbeing of the treated—are not statistically significant. Total household expenditures went up approximately 28 PPP US$, a figure that is also statistically insignificant. These calculations ignore the fact that some treated farmers received RBD services for a longer period of time. Future analysis will explore whether impacts vary with the duration of treatment.

Figure 3. Short-term impact and hypothetical continued growth

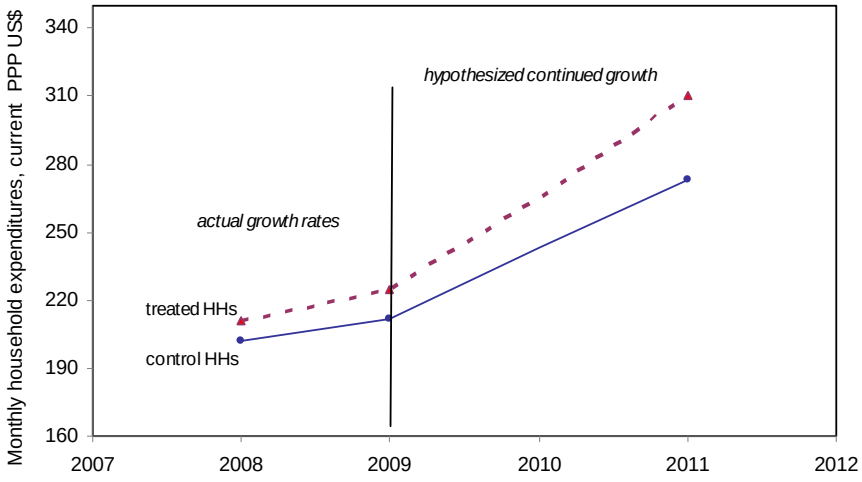


Figure 3 graphs the results found in Table 2 to show the implied growth trajectories. Based on analysis of the survey results from both round one (2007) and round two (2009), Figure 3 charts the different actual growth rates during this time period. We might

hypothesize that the impact of business services will increase over time as farmers better learn to utilize the new opportunities and as their own investment in these ventures is crowded in. In this way, business services act not unlike an investment in a financial account that accrues interest: the earlier one has the opportunity to participate in the project, the more of a head start in growth for that person's income, which allows the income to accumulate ever faster over time. The hypothesized growth trajectories on the right side of Figure 3 illustrate what this might look like. The third round survey data, to be collected in the first quarter of 2011, will allow investigation of this hypothesis.

Heterogeneous treatment effects

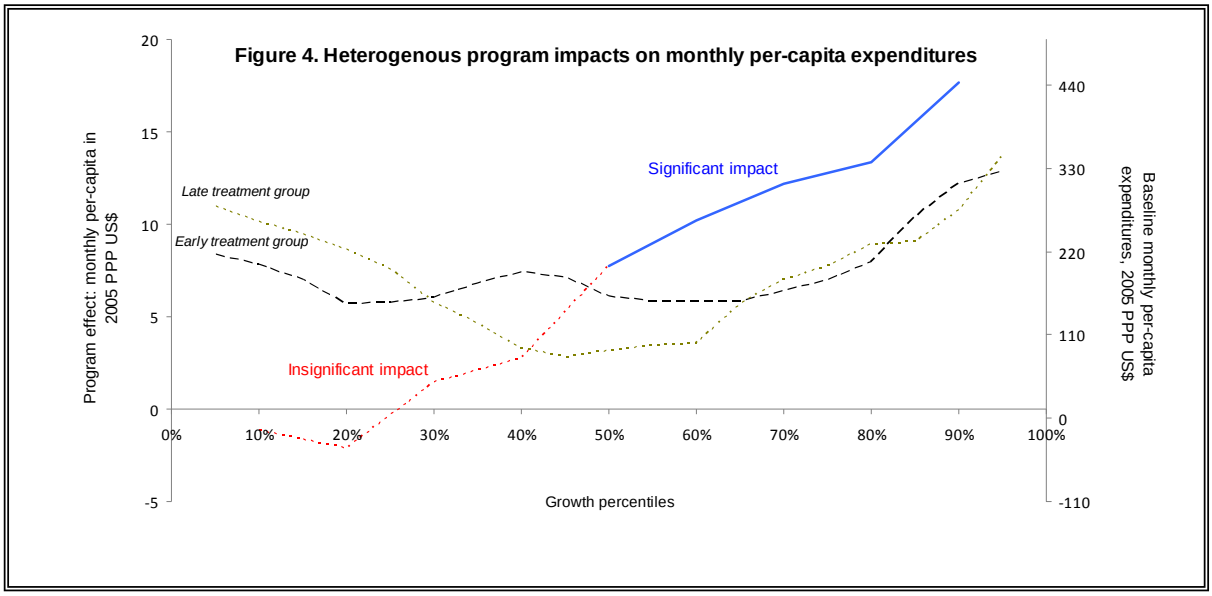
Impact evaluations often use the rise in average monthly expenditures across all study households to gauge the impact of a development program on economic wellbeing. Using this indicator, and as shown in Table 2, the RBD project did not have a statistically significant impact on the monthly per-capita expenditures of participating households. Yet this average impact does not tell the full story.

Digging deeper into the analysis, we found that treatment effects are significant for what might be termed high-growth households, those whose growth in per-capita expenditures from the baseline to the second survey is higher than average. Conversely, a low-growth household is one whose expenditure growth is below average. Note that we can rank all early treatment households from lowest to highest growers. A similar ranking can be done for all control (late treatment) households.

Interestingly, we find that if we compare high-growth treatment households with high-growth control households, we obtain estimates of RBD project impacts that are statistically significant and range up to 18 PPP US$ per person, per month, a level that is some four times the average impact reported in Table 2. Conversely, if we compare low-growth treated households with low-growth control households, we find no, or even slightly negative, project impacts.

Econometrically, these heterogeneous impact results were identified using generalized quantile regression analysis. It is important to stress that these results indicate that the treatment effect is not the same across the entire population (program impacts are heterogeneous) and that the average treatment effect poorly represents what is going on in the data.

Figure 4 presents the character of these results in a graphical fashion. On the horizontal axis, we array households in order of their baseline to mid-line growth, with slow-growth households on the left (low percentile rankings) and high-growth households on the right (high percentile rankings). Percentile ranks are calculated separately for treatment and control households. For each percentile range, Figure 4 presents an estimator of the project impact which could be interpreted as a difference-in-difference estimator, for example by taking the expenditure growth for low-growth treatment households and subtracting from it the expenditure growth for low-growth control households. The dotted-dashed impact line in Figure 4 plots these percentile-specific difference-in-difference estimates. As can be seen,



the impacts are insignificant and slightly negative for low percentile households. Among better-performing households (above the 50th percentile), the impacts become positive and statistically significant. At the 50th percentile, the impact estimate is about 8 PPP US$ per person, per month; whereas the impact rises to more than double that level when comparing the highest-percentile treatment households with the highest-percentile control households. If we translate these figures into internal rates of return (assuming that the impacts persist for 15 years and using the actual average program costs), we find that the internal rate of return is 1% at the 50th percentile and 14% at the 90th percentile.

What explains this variation in the impact of the RBD project across households? Given that the RBD project established minimum conditions for project eligibility, we might suspect that the low performers would be those households with fewer assets and lower initial living standards. Importantly, the data do not support this interpretation. Projected onto Figure 4 are the initial baseline living standards of the households in the different growth percentiles. As can be seen, the initial living standards of high performing households are no higher than those of other households. Indeed, if anything, the data suggest that initial living standards were higher among low-growth households in both treatment and control groups. While further analysis is needed to corroborate this interpretation, it has the provocative implication that the RBD program could have reached further down the income distribution by lowering initial asset requirements and targeting the initially less well-off farmers.

If it is not initial level of wellbeing that explains who benefits more from RBD services, then what does? While future analysis will explore this question, one possible answer is that high performance (and therefore high expected impact) can be attributed to an easily observable characteristic. In this case, program targeting could be improved with resources devoted to the top half of the population that would be expected to benefit. Or, it may even be that high performance characteristic is something that can be changed (for example, through good capital access) to improve overall program performance.

On the other hand, it is also possible that high performance and high impact cannot be attributed to any easily observable characteristic. For example, we know that not everyone succeeds in business (even when trying). It may well be that the high-growth households in both treatment and control groups are simply better entrepreneurs and that RBD services help these entrepreneurs do even better, while having little impact on less able entrepreneurs. If those with good entrepreneurial skills cannot be distinguished ahead of time from those with low entrepreneurial skills, then projects like the RBD simply need to be understood as "leaky bucket" endeavors, in which some project expenditures leak to those unable to benefit from them.

In summary, the finding of heterogeneous impacts is important, but it remains to be seen if that finding has explicit programming implications or is simply an indication that one cost of RBD-like projects is the expenditure of funds on those who will not benefit from them. A future brief will explore this topic further.

Deepening the evaluation

Early results suggest that the RBD project does have significant impact on the economic wellbeing of many rural households, but it does not work for everyone. In light of the initial evidence of uneven impact among participants, we will attempt to clarify why some households gain significant impact from the project while other households participate but do not enjoy benefits. Variables such as credit constraints and tenure conditions could explain some of this impact heterogeneity. Program expenditures also are higher for some activities (for example, livestock) than for others (for example, sesame), and it may be that the larger benefits simply reflect this differential.

The analysis also shows that the RBD project did not directly benefit many households below the mid-point of the rural income distribution. How far down the distribution a technology and business skill transfer project can go is an important and always difficult question. The results so far obtained from this study show that the effect of the program has no relation to the initial living standard of a household. Households close to the eligibility floor could obtain the same absolute benefit from the RBD project as easily as households with a higher endowment of assets. If substantiated, this finding suggests that this MCA project, as well as similar projects, might consider reaching further down the wealth distribution.

AMA Research Theme:

Access to Finance

Without access to credit, households are likely to engage in low-risk low-return income strategies that inhibit their ability to accumulate assets over time. If they were able to access capital to finance input purchases or other investments, they could improve both their short and long term earnings and wellbeing. Unfortunately, there are many good reasons why households have trouble accessing capital.

AMA researchers are looking at different innovations to help expand the provision of financial services. By understanding the circumstances that create incomplete access to finance, we can then generate a set of products and policies that will improve both the supply and the demand for credit.

AMA project

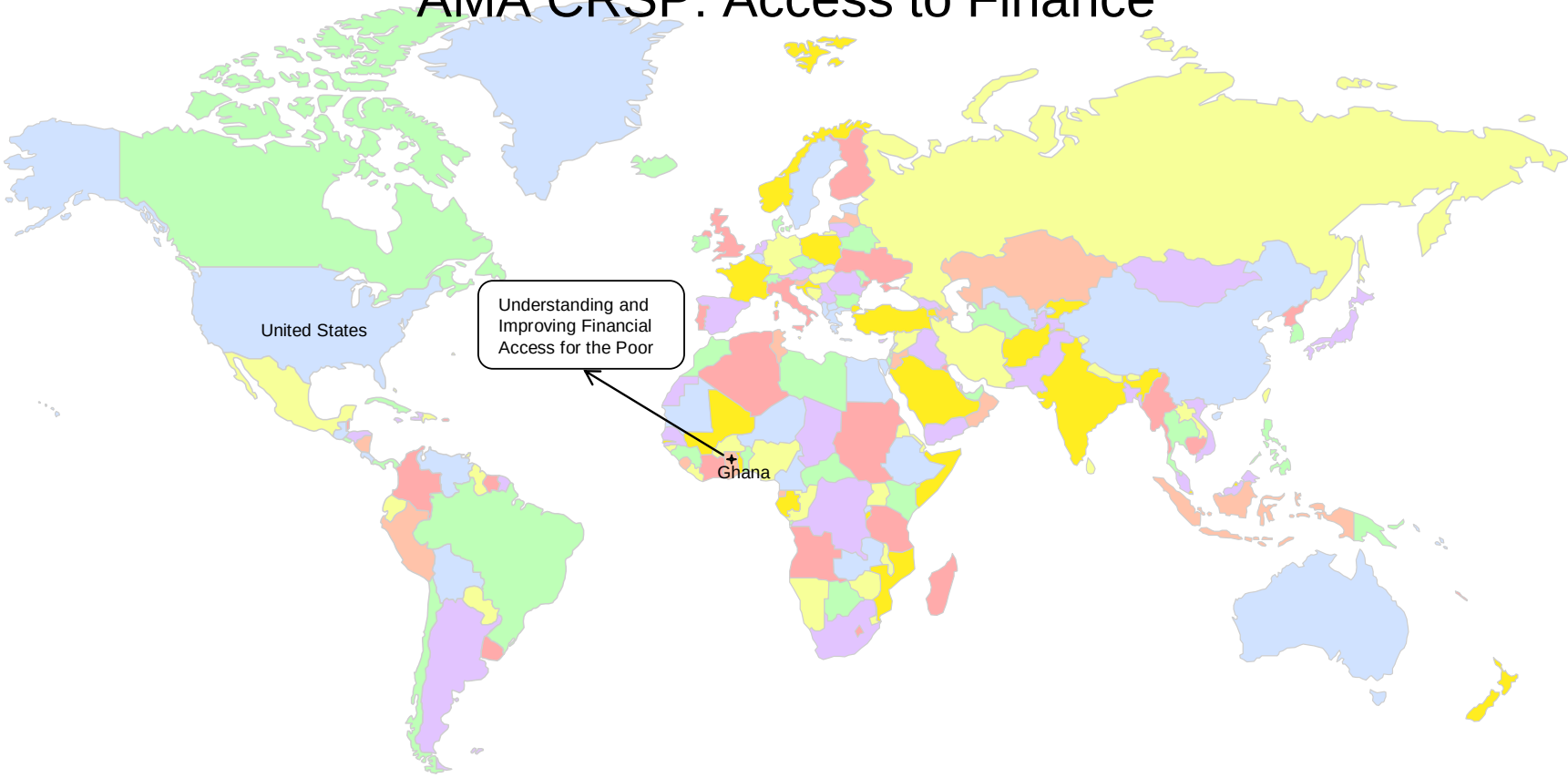
- Understanding and Improving Financial Access for the Poor (Ghana)

AMA BASIS Briefs

BASIS Brief no. 2008-04: "Understanding and Improving Financial Access for the Poor," by Ernest Aryeetey, Dean Karlan, Justin Oliver, Laura Schechter, and Jonathan Zinman.

BASIS Brief no. 2010-06. "Identifying Borrowers in Malawi: Dynamic Incentives in Rural Credit Markets," by Xavier Giné, Jessica Goldberg, and Dean Yang.

AMA CRSP: Access to Finance



UNDERSTANDING AND IMPROVING FINANCIAL ACCESS FOR THE POOR (GHANA)

Principal Investigators

Ernest Aryeetey, University of Ghana, Legon

Dean Karlan, Yale University

http://www.basis.wisc.edu/projects_ama/Microfinance_Ghana.html

Many poor households lack access to financial markets and services, which limits their ability to undertake higher return production strategies. This project seeks to improve access for the poor by identifying mechanisms that create incomplete access, which innovations are effective at expanding access, and finally in looking at the welfare implications of expanded financial services.

We focus on four questions.

1. What demand and supply mechanisms in these markets create incomplete access for low income populations?
2. How do psychological and social barriers affect access to savings?
3. Which innovations in microfinance products and policy measures are effective in expanding access?
4. What are the welfare implications for interventions designed to expand access to financial services?

We address the questions through rigorous research so as to provide policy-relevant and actionable results for policy makers, banks, microfinance institutions, insurance companies and individuals that can be used to make informed decisions. For example, data collected on returns to capital versus returns to capital when combines with rainfall insurance among farmers will allow for improved understanding of the rate of return on investments in the agricultural sector. Data collected on the impact of goal setting through account labeling could shed light on the effectiveness of one cost effective way of encouraging savings behavior. Information on investment decisions and agricultural yield among farmers covered by the index based rainfall insurance product will fill in significant holes in current knowledge base around agricultural risk and the effectiveness of micro-insurance products among populations with low literacy and numeracy levels. A better understanding of how best to help the ultra-poor access microfinance services could help to increase the number of poor households with access to financial services as well as an overall expansion of credit and savings markets.

Collaborations

Yale University Economic Growth Center Dataset. We take advantage of a unique panel dataset designed to provide data on 5,000 households in collaboration with the Institute of Statistical, Social and Economic Research at the University of Ghana (ISSER), and with the Ghana Statistical Service (GSS).

Ministry of Food and Agriculture (MoFA). MOFA is an essential partner in numerous projects ongoing in Ghana. Valuable consultations and collaboration with MOFA staff have occurred at all levels. Meetings with agricultural extension agents in the field have provided important insights and important data which have informed study designs and dissemination strategies. Extension agents have also been involved in IPA field staff training, reviewing village entry procedures and tips on working with rural farmers.

Institute of Statistical, Social & Economic Research (ISSER). The partnership with ISSER greatly extended IPAs research network in Ghana, allowed for closer collaboration with local researchers, provided valuable advice on data availability and data services in country, and resulted in assistance from local interns and researchers. Knowledge shared about local researchers, previous research completed, and other regional resources have been invaluable. In January 2009, ISSER collaborated with IPA on a large Financial Access conference. ISSER's continuing involvement in the Yale Panel Surveys and MiDA (GLSS5+) Surveys allows for regular updates on progress and opportunities for collaboration.

Outputs

BASIS Brief no. 2008-04: "Understanding and Improving Financial Access for the Poor," by Ernest Aryeetey, Dean Karlan, Justin Oliver, Laura Schechter, and Jonathan Zinman.

IPA Ghana hired a Policy and Communications Intern to develop policy and dissemination materials designed to reach local policy makers and practitioners in the agricultural, financial, health and education sectors. A renowned photographer, Aude Guerrucci, visited Ghana so as to document IPA Ghana's work. The videographer Niyati Shah documented IPA Ghana projects to be featured short and long education and communication videos to be disseminated electronically through YouTube and the IPA website.

Updates, commentary and ideas are regularly shared on the IPA Blog.

ACTIVITIES

This year we continued our several randomized field experiments in Ghana on accessing microfinance, insurance and savings.

Measuring returns to capital and insurance among farmers. This study examines how insurance products and capital shocks impact farmers' investment decisions, by comparing groups that have received a direct transfer of capital, rainfall insurance product, or both capital and insurance. Other farmers serve as the control group and receive no intervention, but are monitored and surveyed.

A census of maize farmers was conducted in the areas surrounding the meteorological stations to increase the sample size. A survey team was trained and the follow-up survey was conducted with the 500 participating farmers from the first year's sample directly after the maize harvest. At the same time, a baseline survey was conducted with 500 new maize farmers from the same and surrounding districts. Combined, these 1000 maize farmers made up the sample for the year 2010 and they were randomly assigned to the different treatment groups. As part of the survey process farmers had their farm plots measured and sample of soil collected for testing of color and texture.

The index-based insurance was modified from the number of days of rainfall per month to the consecutiveness of rainfall and the consecutive absence of rainfall. The product remained simple and was easy for farmers to comprehend. The farmers were assigned to receive one of the following treatments:

- Subsidized rainfall insurance: farmers were marketed the index-based rainfall insurance product at a discounted price. Coverage lasts June-September.
- Rainfall insurance: farmers were marketed the index-based rainfall insurance product and charged the actuarial fair price.
- Capital drops: farmers were given capital of GHC 350 each in June, which marks the beginning of the farming season in the north.
- Capital drops and rainfall insurance: both capital drops and insurance product were offered.

Interviewing a Ghanaian farmer. This AMA project seeks ways to improve the poor's access to financial services.

- Control: farmers received no capital or insurance drops during the study, serving as the comparison group.

Data collected during the follow-up surveys continues to be analyzed and the collected soil samples are also in the process of being tested.

The insurance team made payouts during the threshold period from June-September 2010, with rainfall data from local metrological stations monitored carefully. We engaged in a search for insurance companies and microfinance institutions to partner with so that we can improve and market the rainfall insurance product on a larger scale in a more affordable way. This search also parallels a search for reinsurance companies.

We modified the insurance product for the next marketing season with the hope of developing better and less costly distribution channels of marketing the rainfall insurance product. Teams were trained for marketing the rainfall insurance product immediately after harvest in November. This insurance will cover the 2011 farming season. A follow-up farmer survey will be implemented in February 2011.

Savings account labeling and financial literacy training for susu *customers*. We are testing the impact of account labeling on savings behavior among customers of *susu* agents (savings collectors) in rural Ghana. Our goal is to understand if this purely psychological savings product, which allows labeling of funds within an account to direct them towards a specific goal, helps customers increase their savings rates. To ascertain the effectiveness of this product, we administered a census survey to actively saving *susu* customers across five Mumuadu Bank branches and then randomly selected half the customers to offer the labeled *susu* savings product.

Over the past year, we surveyed 2,364 customers across four Mumuadu branches and opened 956 labeled *susu* savings accounts. The labeled savings product has been well-received by Mumuadu customers, with 96% of those offered opening a labeled account. Due to the product's staggered rollout, customers have operated their accounts from one to nine months across the five branches. As of June 28, 2010, a total of 42,797.80 Ghana Cedis had been deposited across 416 accounts.

While analysis is ongoing, preliminary results indicate that customers are using the new account to augment, rather than supplant, their previous savings activity. Beyond the direct impact on savings, the census and account offer generated positive buzz about Mumuadu's "new" and "innovative" savings product.

We are designing a follow-up survey to measure the impact of the labeled account on customer consumption habits. Over the next year, we plan to administer a follow-up survey staggered across each of the branches after customers have been operating the labeled account for nine months.

During July and August of 2010, IPA administered the census to *susu* customers at the first Mumuadu branch in Nkawkaw. During these initial operations, we encountered challenges, e.g., trouble locating infrequent savers. Despite these difficulties, we were able to locate and administer census surveys to 753 of 1,225 registered Nkawkaw customers. At a September 2010 meeting, IPA and Mumuadu discussed the challenges faced during the Nkawkaw census and agreed that IPA surveyors, rather than Mumuadu *susu* agents, would offer the labeled accounts to selected customers. This system maximized both IPA and Mumuadu's resources as the surveyors offered the account consistently while the *susu* agents were free to focus on savings collections.

Mumuadu and IPA decided to drop the financial education component from the study. By concentrating solely on the impact of the labeled savings product, we gain a deeper understanding of to how to mobilize

Improving welfare for farmers. Offering insurance and capital to randomly selected maize farmers allowed us to measure the increases to production and revenue gained by these farmers.

additional savings from *susu* customers, while creating a product that Mumuadu can easily maintain over the long-run.

During October and November 2009, 247 customers opened labeled savings accounts out of 259 who were offered rate at the Nkawkaw branch. After this positive response to the product, IPA elected to proceed with field operations at four other branches. Between November 2009 and June 2010, the census survey was administered to 1,611 savings *susu* customers across Mumuadu branches at Osino, Suhum, Koforidua and Kibi. Of 738 that were offered, a total of 709 labeled *susu* savings accounts were opened.

In May 2010, we began preliminary analysis after labeled accounts had been in operation for six months at the Nkawkaw branch. Our initial results indicate that the labeled account effectively increased savings rates for customers in the treatment group. As a result, IPA decided to administer a follow-up survey to better understand how this product may have changed customer consumption and saving habits. IPA and Mumuadu extended the partnership for another year to administer the follow-up survey.

The follow-up survey will roll out one branch at a time approximately nine months after the labeled accounts began operation at each location. This will involve training and hiring a team of highly qualified surveyors able to both administer a complicated instrument and locate hard-to-find customers. We anticipate finishing the follow-up survey in April 2011.

Returns to business management consulting. Are micro-entrepreneurs dynamic, business-savvy thinkers held back only by their access to affordable capital, or is the picture more complex, with many micro-entrepreneurs lacking the business acumen to make profitable investments even if they had perfect access to capital?

By providing management consulting services and/or capital grants to a group of 160 micro-entrepreneurs we are addressing this question. By rigorously evaluating the project, we will discover insights into the importance of entrepreneurial acumen, access to capital and the combination of acumen and capital that can help answer broad and pressing questions on how to unlock microenterprise growth.

Between February 2009 and February 2010, the firm of Ernst and Young provided four consultants for the study, who collectively logged a total of 788 hours of consulting with the entrepreneurs and 488 hours of additional support time. Ernst and Young also provided one consultant between October 2008 and February 2009 to design the project.

Forty of the micro-entrepreneurs received a grant of US$133 to measure their returns to capital, and 40 other micro-entrepreneurs received the grant but no consulting. Another 40 micro-entrepreneurs served as a control group who received neither consulting nor capital. The micro-entrepreneurs are all small tailors/seamstresses chosen at random from a census of tailors/seamstresses in Accra.

The consulting services and capital grants were allocated randomly. This allows us to clearly identify whether improved business practices, access to capital, or both better business practices and access to capital are necessary to unlock the growth of microenterprises in urban Ghana.

IPA administered seven rounds of questionnaires with the tailors between December 2008 and January 2010 and delivered the capital grants in October 2009. One more round of questionnaires is scheduled for September 2010.

Throughout August 2009, the tailors were visited every other day and asked about the previous days' sales, expenses and hours worked. In September, we conducted a follow-up survey that focused on financial outcomes and can serve as a test of the respondents understanding of the financial measures we collected in August. In October, we gave 75 tailors a grant of US$133.

In December, we conducted a large follow-up survey focused on financial outcomes. We covered numerous areas related to investments, expenditures, savings and lending history, financial and business knowledge, and profits. We conducted another large follow-up survey in January 2010. This survey focused on business practices, preferences, management, household outcomes, and attitudes. In September, another follow-up survey focused on financial outcomes. We are analyzing data and will present preliminary findings in 2011.

Ghana microfinance graduation pilot. We began an impact evaluation of the Targeting the Ultra Poor (TUP) Graduation Model in northern Ghana. The evaluation will measure the model's ability to move chronically poor households from extreme poverty to self-sufficiency over a twenty-four month period by combining consumption support (the transfer of a productive asset) with an intensive period of training, financial education and savings.

Chart 1: Effect of insurance and capital on chemical spending

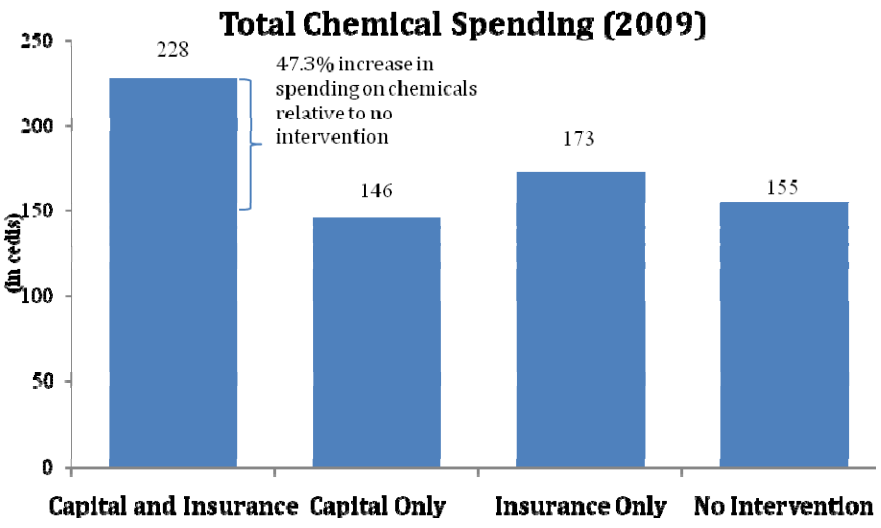
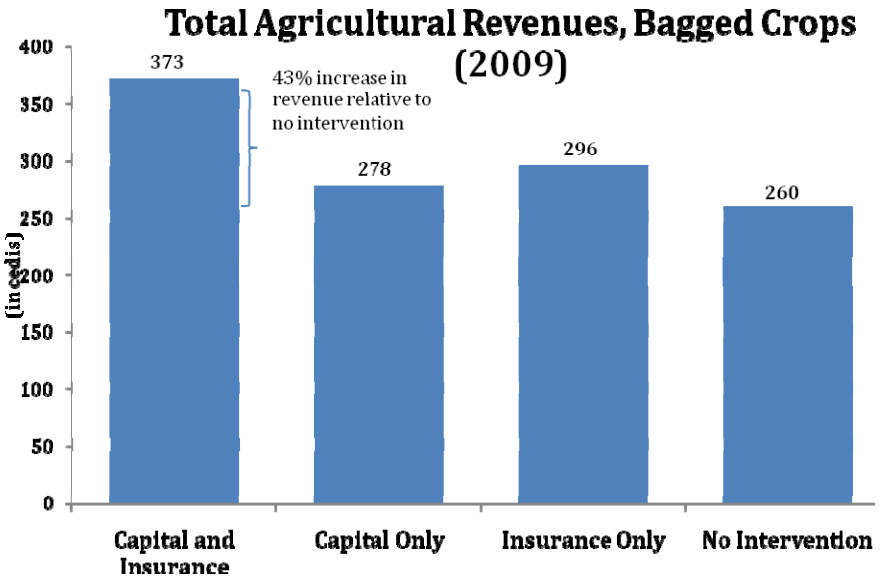


Chart 2: Effect of insurance and capital on agricultural revenue



The TUP intervention is one method of enabling the ultra-poor to learn to use micro-entrepreneurship to build businesses and improve their lives. The TUP program first identifies the ultra-poor within a community, and intensively works with these families to improve business-oriented skills. The TUP households are provided the transfer a productive asset (such as a cow or goats) with which they will start their enterprise development. There also is a community-based component, where TUP works with local leaders to alleviate community-wide sources of poverty (e.g., providing safer water supplies to reduce levels of sickness). The program hopes for positive changes in school attendance of children, food security, health, and increased assets among the ultra-poor.

Through this study, IPA and its partners will be able answer questions on how best to help the poor escape ultra-poverty through livelihoods training, savings, asset transfers, etc. This project was recently launched. We are helping to identify the 1400 households that will be sampled.

FINDINGS

Most of the studies are ongoing. IPA will organize a conference in microfinance in fall 2011. This is an opportunity to present the preliminary results from all the studies summarized above. To date, we have preliminary results only from the project that measures returns to capital and insurance among farmers. In July 2010, IPA hosted a conference presenting this project's initial results to local policy makers, academics, MFIs, banks, insurance companies and NGOs.

There was high take up in the marketing of the index-based insurance product. When IPA offered selected farmers insurance at one Ghanaian cedi (GHC) per acre, 88.1% of farmers offered insurance at this rate purchased it. When IPA then offered the same insurance product at GHC4 per acre, take-up was 71%. These high take-up rates prompted IPA to offer the product at the actuarially fair and commercial rates of 8, 9.5, 12 and 14 cedis during February and March 2010. Take-up rates were approximately 42%, 41%, 19% and 8% percent respectively.

Analysis is ongoing, yet the take-up and survey results show a positive impact of the treatment offered to the farmers. In July 2010, a conference was held in Tamale to disseminate initial results of the study with partner organizations, MFIs, insurance companies, agricultural organizations and academics, among others.

Providing capital and insurance to farmers made a huge difference in their practices, investments and behaviors during the 2009 agricultural season. As shown in charts 1 and 2, opposite page, farmers with capital *and* insurance spent 47 % more on fertilizer compared to the control group, and farmers also increased revenue from bagged crops by 43 %. Farmers cultivated 23 % more acres compared to the control group and increased the proportion of hired labor from 12% to 17%.

Farmers with only insurance (not coupled with the capital) still spent 11 % more on fertilizer compared to the control group and cultivated 26.5% more acres compared to the control group. Under both treatments, farmers missed fewer meals and sent their children to school more frequently.

AMA Research Theme:

Asset Building and Pathways from Poverty

Assets and natural resources can play a key role in helping households move out of poverty. In some cases safety nets—such as food aid or cash transfers that help households stay above critical thresholds in times of need—are the most appropriate. In other cases, households that are already below the poverty line need help climbing out. Policy reform, such as land titling, helps to protect households' assets and allows them to make more productive long term decisions. Other government interventions, such as aid programs, conditional transfers, and educational programs help give poor households the tools they need to get on a successful pathway out of poverty. The goal is to protect existing assets and create an environment that allows for further asset accumulation over time, giving households the resources they need to manage shocks and stay out of poverty. AMA researchers are looking at the implementation of different policies, including transfer programs and land tenure reform, and are forming recommendations on how these programming interventions might have a greater impact for poor households.

Use of natural resources, such as forest products, is necessary for many people's livelihoods. Yet, often, incentives for sustainable use of the resources are lacking. It is important to protect resource quality over time. Understanding how households use their natural environment can help us develop policies to protect both the user and the resource. Innovations such as payment for environmental services programs and other initiatives are providing new alternatives in the successful management of forest and agricultural resources. AMA researchers are investigating policies that will protect both resources and those households that depend on their use.

AMA projects

- Cash Transfers, Risk Management, and Asset Accumulation: Policy Evaluation for Rural Poverty Reduction in Nicaragua
- Pathways for Ensuring Access to Assets: Land Reform and Beyond (Liberia and Uganda)
- Natural Capital and Poverty Reduction (Malawi and Uganda)
- Impact Evaluation of the Crédito Fundiário Land Reform Program in Brazil: A Siblings Approach
- Does International Child Sponsorship Work? A Six-Country Study of Impacts on Adult Life Outcomes
- Using Local Food Aid Procurement to Transform Relief into Development: Market Information and Food Insecurity Response Analysis

AMA BASIS Briefs

BASIS Brief no. 2010-07. “Impact of Subsidies on Fertilizer Use, Land Allocation and Forest Pressure: Evidence from Malawi,” by Christopher Chibwana, Charles Jumbe, John Mazunda, Monica Fisher and Gerald Shively.

BASIS Brief no. 2010-05. “Income, Poverty and Charcoal Production in Western Uganda,” by Fydess Khundi, Pamela Jagger, Gerald Shively, and Dick Sserunkuuma.

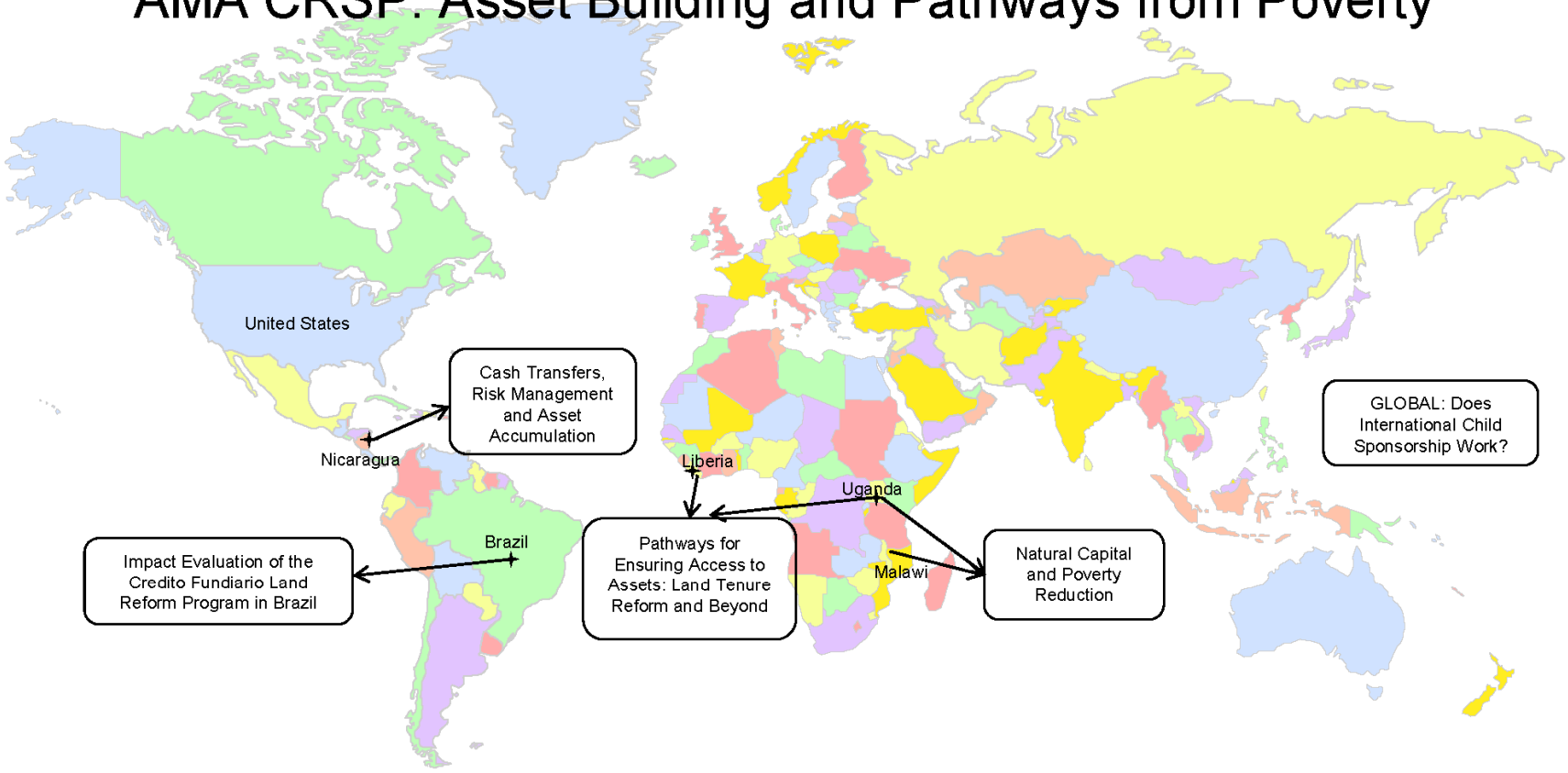
BASIS Brief no. 2010-03. “Food Aid, Food Prices and Producer Disincentives in Ethiopia,” by Getaw Tadesse and Gerald Shively.

BASIS Brief no. 2007-02. “Land Tenure Reform and Beyond: Ensuring Women's Access to Assets,” by Cheryl Doss, Ruth Meinzen-Dick, Jeanette Carter, and Gorettie Nabanoga.

BASIS Brief no. 2007-01. “Evaluating and Improving Interventions for Asset Accumulation, Risk Management, and Rural Poverty Reduction in Nicaragua,” by Karen Macours, Renos Vakis and Vanessa Castro.

BASIS Brief no. 2008-02. “Using Natural Capital to Manage Risk and Reduce Poverty,” by Arild Angelsen, Monica Fisher, Charles Jumbe, Gerald Shively, and Dick Sserunkuuma.

AMA CRSP: Asset Building and Pathways from Poverty



CASH TRANSFERS, RISK MANAGEMENT, AND ASSET ACCUMULATION:

POLICY EVALUATION FOR RURAL POVERTY REDUCTION IN NICARAGUA

Principal Investigators

Vanessa Castro, Centro de Investigación y Acción Educativa Social, Nicaragua

Karen Macours, Johns Hopkins University, USA

http://www.basis.wisc.edu/projects_ama/rural_poverty_reduction.html

A lack of minimum endowment of assets can cause households to be stuck in long-term poverty traps, and negative shocks can cause households to fall below the minimum asset threshold necessary to pull themselves out of poverty. Conditional cash transfers are one mechanism to help increase asset endowments, as well as investment in education, health and nutrition. This project aims to look at the long-term impact of a cash transfer pilot program, and whether it increases the asset base and/or facilitates income diversification. It will also look at the changes in household's return on productive activities following their participation in the program.

The project looks at a recently complete pilot program by the Ministerio de la Familia (MIFAMILIA) in Nicaragua. This program combines a traditional conditional cash transfer program with additional interventions aimed at increasing the asset base and risk management capacity of rural poor households exposed to weather risk (droughts).

By providing evidence on the effectiveness of different types of interventions, this project informs the recently inaugurated government team in charge of social policy and rural development, and informs the debate surrounding the restructuring of existing initiatives. The project addresses a number of the policy priorities of the new Nicaraguan government, including reduction of hunger and extreme poverty, malnutrition, gender empowerment and microfinance, and sheds light on discussions regarding the effectiveness of conditional cash transfers as opposed to other programs, such as food aid.

Additional support

World Bank: $329,069

Collaborations

This research builds on the randomized design of the pilot program *Atencion a Crisis* in Nicaragua, implemented between November 2005 and December 2006. There are strong synergies between the activities under the BASIS project and at least three other activities by Nicaragua's Ministry of the Family.

The most direct synergies exist between the evaluation of *Atencion a Crisis* and a new evaluation of the original conditional cash transfer program in Nicaragua (the *Red de Proteccion Social*, which started in 2000 and was implemented in a different part of the country). This evaluation will focus on the long-term impacts on human capital accumulation. To the extent possible, similar outcome measures will be used (e.g., same cognitive tests, labor market histories, etc.) in order to increase the lessons learned from both projects.

The ministry recently restarted a centrum-based early childhood development intervention (PAININ), which partly covers the same communities than the *Atencion a Crisis* pilot and the complementary early childhood development pilot focused on parents. The sample of treatment communities for the early childhood development pilot is balanced between communities with and without PAININ.

The ministry started a new program focused on early childhood development in urban areas of Nicaragua, financed by the IADB. Given the similarities with the objectives of some of the components of *Atencion a Crisis*, there is an ongoing dialogue with the IADB team to coordinate between the evaluations in order to increase the lessons learned.

The ministry is considering a new program on social protection through house visits by community workers (following the model of *Chile Solidario*) and focused on empowerment, early childhood, reduction of child labor, and labor market integration in urban areas of Nicaragua, with possible financing from the World Bank. Given the similarities with the objectives and approaches of some of the components of *Atencion a Crisis* and the complementary interventions, initial conversations have been held to share lessons learned.

More broadly, there has been a relatively extensive sharing of methods and approaches with other projects that focus on measuring early childhood development outcomes—in particular World Bank and Inter-American Development Bank projects in Ecuador, Brazil, Cambodia, Chile, Colombia and Mozambique.

Outputs

BASIS Brief no. 2007-01. "Evaluating and Improving Interventions for Asset Accumulation, Risk Management, and Rural Poverty Reduction in Nicaragua," by Karen Macours, Renos Vakis and Vanessa Castro.

Del Carpio, Ximena, and Karen Macours. 2008. "Leveling the intra-household playing field: Compensation and Specialization in Child Labor Allocation." World Bank Policy Research Working Paper Report No. WPS4822. Also forthcoming in *Research in Labor Economics.*

Macours, Karen, and Renos Vakis, 2008. "Changing households' investments and aspirations through social interactions: Evidence from a randomized transfer program in a low-income country." Johns Hopkins University and World Bank Working Paper Report No. 45211.

Macours, Karen. Norbert Schady and Renos Vakis. 2008. "Cash Transfers, Behavioral Changes, and Cognitive Development in Early Childhood: Evidence from a Randomized Experiment." World Bank Policy Research Working Paper No. 4759.

Macours, Karen, Fernando Galeana and Renos Vakis. "Supply-side Responses to High Food Prices: Evidence from Small Farmers in Nicaragua."

Publications aimed at dissemination of market and community information gathered during qualitative fieldwork in Spanish: one children's tale (*la panadera emprendadora*), two comics (*Como comprar y vender; Como invertir tus ganancias*), and two informational brochures.

ACTIVITIES

The project builds on the design of a multi-dimensional pilot program in Nicaragua that randomly assigned three different interventions targeting short-term risk coping and long-term asset accumulation and risk management. The analysis of the third round of the panel dataset is underway and will shed light on the original intervention's medium-term impacts (two years after the end of the intervention).

We focused on possible impacts of each of the three interventions on household income diversification and risk management. We also analyzed the longer-term impacts on early childhood development outcomes, and used the experimental variation between treatment groups to shed more light on the underlying mechanisms.

Preliminary analysis has considered

- a household's other investments in human capital after the end of the program, in particular, education, health, nutrition
- changes in household physical and social assets
- the heterogeneity of medium-term impacts on productive activities of the productive investment grants and the training package
- medium-term impacts on gender empowerment
- household aspirations, attitudes, and social interactions.

Research findings of the impact evaluation were disseminated through a number of seminars and conferences. Findings were presented at academic and policy conferences and seminars at Cornell, George Mason, Maryland, Yale University, Paris School of Economics, Toulouse School of Economics, and the IZA/World Bank conference on employment and development.

House visits by community educators as part of the complementary early childhood development pilot intervention started in October 2009 and are ongoing. Two different modalities of the intervention are being piloted (one targeted primarily at mothers, the other targeted primarily at fathers), and are randomly assigned to households in the three original treatment groups and households in the comparison group.

Given that the intervention has a community focus, the randomization was done at the level of the community. This will allow a rigorous evaluation of the complementary impacts for different types of beneficiaries and also capitalizes on the prior rounds of data, allowing for a difference-in-difference and/or fixed effects estimation.

Due to identified differences in the intensity and quality of the house visits by the educators, a decision was made to improve the monitoring and extend the intervention until 2011. Extra funds were obtained from the World Bank for the extension and monitoring.

In the complementary early childhood development pilot interventions, CIASES has been working with 58 community educators, who are playing a key role in the capacity training and home visits during the year. These community educators received short and focused training courses in early childhood development practices designed specifically for this pilot. Over the course of the, a total of 15 days of training was given the community educators. They also received personnel technical assistance and guidance.

A team conducted a qualitative evaluation of the early childhood development pilot. Qualitative impacts on behavior of both parents and children were identified. At the same time, the qualitative evaluation pointed to serious concerns regarding compliance by the community educators. Compliance is monitored on an ongoing basis. A total of six young Nicaraguan researchers were trained to monitor and qualitatively evaluated these activities.

Our early childhood development research received much attention from policy-makers, in particular at the Inter-American Development Bank, which is heavily investing in this topic. The research has been used in policy dialogue between the Inter-American Development Bank and its client countries. The research also has been presented in the framework of a planning workshop for a new early childhood development intervention (by the government of Nicaragua) in Managua to an audience including national policy-makers and leading local experts.

FINDINGS

Transfer programs that combine a social safety net approach with mechanisms to increase a household's asset base and diversify economic activities can enhance household risk management. Two years after the intervention, we found that beneficiary household consumption, in particular food consumption, was less affected by negative weather shocks when compared to household consumption in non-treatment families. Impacts are found to be larger for households that received transfers to invest in productive activities, in addition to transfers targeted at human capital. The underlying mechanisms generating these beneficial outcomes appear related to improved income diversification. We also found that changes in a household's attitude regarding traditional and less-traditional activities led to benefits.

The conditional cash transfer program had significant effect on cognitive outcomes, and the impacts were in evidence two years after the end of the program.

Social interactions were found to affect a household's attitude towards its future prospects and to amplify program impacts on investments in human capital and productive activities. Empirical evidence indicated that communication with motivated and successful nearby leaders can lead to higher aspirations and corresponding investment behavior.

The conditional cash transfer program had significant effects on cognitive outcomes, especially language. These impacts were in evidence two years after the program ended. Impacts are larger for older pre-school aged children, who are also more likely to be delayed. The program increased intake of nutrient-rich foods, early stimulation, and use of preventive health care—all of which have been identified as risk factors for development in early childhood. Households increased expenditures on these inputs more than can be accounted for by the increases in cash income only, further suggesting that the program changed behavior on the part of the parents. In part, these changes in behavior are still apparent two years after the end of the program.

The findings suggest that gains in early childhood development outcomes should be taken into account when assessing the benefits of cash transfer programs in developing countries. More broadly, it illustrates that gains in early childhood development can result from interventions that facilitate investments made by parents to reduce risk factors for cognitive development.

The project has resulted in increased capacity, with 138 practitioners, researchers and students, trained in monitoring and impact evaluation methods, and 60 community educators trained in program design and implementation for early childhood development intervention. Also, one US student completed an MA degree and one US student completed a Ph.D. degree. Nicaraguan students are continuing with course work.

PATHWAYS FOR ENSURING ACCESS TO ASSETS:

LAND REFORM AND BEYOND (LIBERIA AND UGANDA)

Principal Investigators

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http://www.basis.wisc.edu/projects_ama/land_tenure_reform.html

This project examines how people gain secure access to assets, including land, and how the patterns differ for women and men. We examine how the formal legal frameworks and social norms, including marital and inheritance patterns, shape the access of individuals to land and other assets. Collecting both community surveys and household and intrahousehold survey data from Liberia and Uganda provides an opportunity to analyze these relationships and draw policy lessons. One unique feature of this data is that we can examine women's access to assets in the context of particular community norms and practices.

The focus on strengthening women's access to land and other assets is well founded. Access to land plays an important role in alleviating rural poverty both directly and indirectly. Land can be a direct source of income, insurance and collateral. Indirectly, land is a source of social status and bargaining power.

Liberia and Uganda provide case studies at two very different points in the land reform process. Liberia is facing increasing pressure, both domestic and international, to resolve land tenure issues that have been exacerbated by years of civil war. Uganda legislated land reform in 1998, but implementation has been limited and uneven across the country. Both Liberia and Uganda exhibit a diversity of land tenure systems, ranging from private and individual to communal and common property and customary and statutory systems coexist.

This project is unique in that most projects interested in land look at access to land in isolation, without considering the interrelationships of land with other assets. We focus on three questions: How do people gain access to assets and how do the patterns differ by gender? Under what conditions are women able to successfully claim assets to which they are entitled? How can policy and practice be modified to ensure that women have secure access to assets and that they can exploit them for productive use in both the short and long run?

Additional support

IFPRI matching support from CGIAR Systemwide Program on Collective Action and Property Rights (funded by Government of Norway, Italy, and World Bank): $16,272.

The University of Liberia provides salary and allowances for Jeanette Carter and office space at the Institute for Research. The Government of Liberia provides in-kind support through the Governance Commission.

Dr. Carter developed the land component of the Millennium Challenge Corporation Threshold Project that will bring approximately US$7 million to the land sector if approved. She also developed a US$200,000 proposal to the Norwegian Refugee Council that is funding several transitional activities for the Governance and Land Commissions, including research activities that will complement the BASIS project.

Collaborations

Cheryl Doss is a PI on a multi-year project, “In Her Name: Measuring the Gender-Asset Gap,” which is collecting large sample surveys in Ecuador, Ghana and India. These household surveys collect sex-disaggregated asset data, using a questionnaire similar to the Uganda instrument. The “In Her Name” project plans a project meeting in Uganda and will invite the Pathways project team to join the meeting to share experiences and lessons learned. In addition, the two projects will collaborate on a policy forum in Uganda in July 2011.

Ruth Meinzen-Dick co-leads an IFPRI global research program on strengthening women’s assets for better development outcomes. This program includes several other research components, which have drawn from the data collection instruments developed under the BASIS project, including a new project funded by Wellspring Advisors for research on women’s land rights in Uganda and Tanzania.

Ruth Meinzen-Dick and Cheryl Doss were advisors/reviewers for the FAO State of Food and Agriculture report 2011 that focuses on gender in agriculture, and which will draw upon insights from this BASIS project in stressing the importance of women’s assets (land as well as other assets).

Ruth Meinzen-Dick participates in the working group on women’s land rights for the International Land Coalition, and will list all outputs of this project on the land portal page on women’s land rights.

Outputs

BASIS Brief no. 2007-02. “Land Tenure Reform and Beyond: Ensuring Women's Access to Assets,” by Cheryl Doss, Ruth Meinzen-Dick, Jeanette Carter, and Gorettie Nabanoga.

Doss, Cheryl, and Ruth Meinzen-Dick. 2009. “Collective Action within the Household.” Paper presented at International Association of Feminist Economists.

Doss, Cheryl, Caren Grown, and Carmen Diana Deere. 2008. “Gender and asset ownership : a guide to collecting individual-level data.” World Bank Policy Research working paper no. WPS 4704.

McCarthy, Nancy. “Customary Land Use in Liberia: A Review of Supreme Court Decisions.” Submitted to Governance Commission of Liberia.

ACTIVITIES

The project year began with a meeting of all four PIs and one team member from Liberia. We reviewed the data collection process in Uganda, looked at very preliminary data analyses, and mapped out further data analysis strategies. For Liberia, the survey data collection had not begun. We reviewed the survey instrument, developed a plan for carrying out the survey, and planned the completion of the qualitative work. We mapped work to be done with a clear timeline and assigned responsibilities.

Uganda. The intrahousehold surveys were completed, and we analyzed the household/intrahousehold surveys. Additional data was collection on life histories to understand the processes of asset accumulation and loss, especially related to inheritance. This was used to draft a paper on women, marriage and asset inheritance in Uganda, which was presented at the Chronic Poverty Research Centre's program on asset inheritance and the intergenerational transmission of poverty.

The database was successfully set up. Further data cleaning and analysis is ongoing for the production of the country reports and academic publications as well as policy briefs. We met with a group from USAID to present an overview of the project.

Two Yale graduate students are involved in the project. The first traveled to Uganda in the summer and interviewed women on their life histories and assets. She is collaborating on a paper on asset in heritance in Uganda. She also is writing up the methodology/practitioner's guide, compiling the bibliography, and writing policy briefs. The second cleaned the Uganda data and worked on a paper on the intrahousehold dimensions of asset ownership.

Liberia. Data collection in Liberia did not proceed according to schedule, but project collaborators were involved in Liberia's preparations for forming a land commission, as well as with donor organizations. We anticipated fielding the household surveys in early 2010. Although the questionnaire was redesigned for Liberia, it was not field tested and the plans for the survey were slowed as we tried to identify appropriate field staff, especially a survey manager. We hoped to work with and train Liberian staff for the project, but were not able to identify such people and train them. It became clear that the Liberian team was unable to carry out the survey, nor was it willing to allow the project to send in another team to manage the data collection.

Therefore, it was not possible to do the household survey data collection through the University of Liberia. As an alternative, we are now working with Innovations for Poverty Action to conduct the first two rounds of a panel survey. In the first round, 4738 individuals were interviewed in three counties. Twenty individuals were randomly selected in each community. The survey focuses on questions about group participation, attitudes about town governance, experiences during the war, and conflict within the community. Basic demographic and income/livelihood data were collected, as well. Data on land and assets were collected at the household level. Our additional questions about asset ownership, both at the individual and household level, fit in well. The asset questions have been incorporated into the survey and have been field tested. We expect to receive cleaned data by early 2011.

Training. Two Ugandan students are enrolled for Masters' degrees in Forestry at Makerere University. The first participated in data collection and data analysis for two districts for his thesis write-up. He also participated as a visiting research assistant at Jackson Institute of Global affairs, Yale University from August to December 2010, and is expected to defend his thesis upon returning from Yale. He visited IFPRI to present results of this study, and met with colleagues from IFPR, ICRW, and other agencies working on land rights or on Uganda.

The second Ugandan successfully completed course work for the first year at Makerere University. She prepared her research proposal for her thesis, which will contribute to one of the project activities in one of the districts. She started data collection in November 2010, following up on the questions raised by analysis of the community tenure profiles and surveys.

Two Liberian students completed their first year in the Master's program in Forestry at Makerere University. They completed their field work and will return to Makerere for a second year to write their theses.

FINDINGS

Going beyond conventional household-level analyses to look at the differential access and control of assets by men and women is important to understand the relationships between poverty and assets. In particular, because women's access to assets is often tied to their relationships within the household and community, they are vulnerable to losing this access when the

household dissolves, either through divorce, desertion or death.

Inheritance is a key means of acquiring assets. Yet, there is relatively little information available on the patterns of asset inheritance disaggregated by sex, especially in Africa. The Ugandan dataset on individual level asset ownership, combined with qualitative data on life histories, provides a unique opportunity to analyze the patterns of asset ownership and inheritance and then asks how asset inheritance impacts the rights over assets. Both of these questions are related to broader policy issues about women's asset ownership and chronic poverty. Understanding how women, as distinct from men, acquire and control assets is critical to developing policies to increase women's productivity and wellbeing.

Results indicate that patterns of ownership, inheritance, and rights over assets are all embedded in relationships within the household and the community. Many women gain access to land—and even claim ownership—through their marital relationships. Both husbands and wives often indicate that land is owned jointly. However, the rights over land differ for men and women, with women having a smaller bundle of rights than men.

Women do inherit land, both from their fathers and from their husbands, although it is much more common for men to inherit land. The bundle of rights over land varies depending on how the land was acquired, with inherited land usually including fewer rights.

While women may successfully access land through their husbands, the problem is that the access then depends on the stability of the marriage. Under most customary systems, a widow can only claim that land that belonged to her husband if she has a son. The land will be inherited by the son and the mother can continue to farm it until the son is grown and can claim it. Women without sons are at risk of losing access to the land, depending on their relationship with their husband's family and the community. The life histories indicate that health shocks to men in the family have a large impact on the wellbeing of the women and children.

Policies need to strengthen women's claims to land that they farm and that they retain as security in the event of the dissolution of their marriage. The various rights over land do not always coexist, so it will be critical to treat them separately. The right to farm the land and keep the proceeds is not necessarily the same as the right to sell or bequeath the land. And it may be important to distinguish between inherited land and purchased land. While strengthening women's formal ties to land may be important, it will not be sufficient to provide women with security from land.

Where men and women do not have titles, it is essential to look more at land access than land ownership.

Our results indicate that many men and women don't have titles; therefore, it is essential to look more at land access rather than land ownership. Survey responses indicate that "owning" land has many meanings beyond titles and documents. Social definitions of rights are as important as legally defined rights in many parts of Uganda, especially where customary tenure and customary marriage practices are strong. However, not only marital status but also type of marriage influences women's land rights, and there seems to be a move toward women having independent land rights in more peri-urban areas (where consensual unions are also more common). Analysis is ongoing to determine the factors that provide women with security of tenure so that they can use land and other assets productively.

NATURAL CAPITAL AND POVERTY REDUCTION (MALAWI AND UGANDA)

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http://www.basis.wisc.edu/projects_ama/Natural_capital.html

In many countries poor households turn to resource extraction to generate income, manage risk and secure livelihoods. However, this strategy prevents them from participating fruitfully in other activities and escaping their poverty. This project will document the ways in which natural capital serves as informal insurance and a safety net against income variability and transitory shocks. It will also examine household dependence on natural resources, and how this varies with wealth, gender and market conditions. Finally, it will look at whether income from natural resources can serve as a pathway out of poverty by helping households accumulate physical, financial and human capital.

Income from resource extraction accounts for up to 45% of total income for rural households in some countries. The importance of resource extraction is amplified in the presence of risk, which will likely increase as climate change threatens productivity, especially in marginal agricultural areas.

Improved information about how households use natural resources and their role in income generation and risk management will help governments generate natural resource management policies that will not disadvantage the poor. In addition, researchers will look at the long term sustainability of resource extraction, and will look to inform policies in directions that improve both economic and environmental outcomes. The project will work to hi light ways to ensure that a larger share of resource rents go to local people, and articulate ways to enhance poverty alleviation without increasing environmental degradation.

Additional support

SANREM CRSP support for synergies between CRSP projects: $49,670.

National Science Foundation supports data collection in Malawi: $50,000.

CIFOR supports data collection: approximately $1,000,000.

Borlaug-LEAP fellowship for student research in Malawi: $20,000.

Collaborations

The primary synergy is with CIFOR's Poverty Environment Network (PEN). The PEN project involves collection in more than 25 countries of environmental and socioeconomic data using a consistent survey instrument and implementation approach. These surveys include a very detailed recording on a quarterly basis of all income sources including all uses of forests. Further, the PEN global dataset, because it contains information from more than 200 communities in 25 countries, will allow us to study how the role of natural resources in supporting and insuring rural livelihoods varies according to forest type, forest tenure, market access, and other contextual factors. PEN household panel data from Malawi and Uganda are being used to study the role of natural insurance in those countries.

The second synergy is with a National Science Foundation (NSF)-funded project that examines causes for poverty at the household level in Malawi and involves quarterly household surveys. This work allows us to expand a previously-conducted household cross-section dataset into a panel so as to better capture income dynamics in the area of Mt. Mulanje in southeastern Malawi. This will complement our other Malawi fieldwork.

An additional synergistic activity has been a collaboration with Gero Carletto at the World Bank to contribute lessons from our involvement in the PEN project to LSMS-ISA efforts in Uganda, Malawi, Ethiopia and Nigeria. We review LSMS-ISA survey instruments to identify gaps in data collection related to the role of natural capital.

Outputs

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Jagger, P. 2009. "Forest Sector Reform, Livelihoods and Sustainability in Western Uganda." In *Governing Africa's Forests in a Globalized World,* edited by L. German, A. Karsenty and A.M. Tiani. London, UK: Earthscan Publications Ltd. and Center for International Forestry Research.

Jagger, P. 2009. *Can Forest Sector Devolution Improve Rural Livelihoods? An Analysis of Forest Income and Institutions in Western Uganda.* Ph.D. Dissertation, Indiana University, Bloomington.

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Khundi, F. 2009. “How do Forest-based livelihoods matter to rural households? Evidence from charcoal producers in Uganda.” MS Thesis. Department of Economics and Resource Management, Norwegian University of Life Legesse, Aas.

Kijima, Y., K. Otsuka and D. Sserunkuuma. 2008. “Assessing the Impact of NERICA on Income and Poverty in Central and Western Uganda.” *Agricultural Economics* **38**: 327-37.

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Tadese, G. and G. Shively. Forthcoming. “Food aid, food prices and producer disincentives in Ethiopia.” *American Journal of Agricultural Economics.*

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ACTIVITIES

Activities the past year continued research, training, and outreach activities in Malawi and Uganda. We maintained a third research trajectory focused on cross-cutting issues, comparative studies, and analysis of a broader set of data and issues than those for Malawi and Uganda.

Uganda

We carried out two household surveys, one focusing on charcoal production (n=600) in the districts of Hoima, Masindi, and Nakasongola and a second focusing on timber production (n=180) in Kabale and Chamba. In addition, an extensive market value chain survey was completed for the charcoal trade between producing villages and the Kampala retail market (n=273). These surveys helped us to directly address one key objective: examining factors influencing household dependence on natural resources and how this reliance varies with levels of income or wealth, gender, and market conditions. Two datasets have been analyzed through collaborative work at Makerere University, Purdue University, and the Norwegian University of Life Sciences.

Two of the surveys were designed to provide a "stump to stove" analysis of charcoal production in three charcoal producing districts in western Uganda. The aim of these studies was to better understand who produces charcoal and how charcoal production fits into the overall livelihood and risk-management strategies of rural households and communities. Importantly, the districts chosen for the surveys differ in their forms of forest-related governance. Initial evidence from the surveys suggests that extraction patterns and rates differ markedly by district, in ways that are not necessarily related to wood availability or market proximity.

Accordingly, we formulated hypotheses related to the impact of local governance on resource extraction and household exposure to risk-mitigating resources. In the case of the value chain surveys, we collected data from nearly 300 market participants, reaching from producing villages to retail markets of Kampala. Analysis of these data focused on decomposing profits along the supply chain to examine issues related to market access, market organization and market power. Through this effort we were able to describe how market structure and performance influence household welfare and risk exposure, which is critical for the design of policies related to this sector. This work resulted in **BASIS Brief 2010-05**, "Income, Poverty and Charcoal Production in Western Uganda," three M.S. theses and two published journal articles.

Our third Uganda survey covers communities in southern Uganda that provide migrant labor for seasonal timber cutting and sawn wood production in the central part of the country. Key hypotheses of interest for this work relate to the role of off-farm labor in mitigating idiosyncratic and covariate (village-level) agricultural risks, and the role of off-farm labor arising from forest resource extraction in asset accumulation. A key feature of the survey design for this study is that the two locations chosen for the study have similar access to forests but different land tenure systems, allowing us to examine the role of the latter in influencing rates of resource extraction. Analysis and write-up for this activity is ongoing.

Our project has helped strengthen research capacity at Makerere University. In June 2010 we conducted a three-day training workshop for members of the university staff, graduate students in forestry and agriculture and various members of government agencies and the NGO and research community. The title of the workshop was "Policy-oriented research for improved policy-making in Uganda." A total of 47 individuals participated (34 males and 13 females). One innovative aspect of the workshop was that participants were provided with the datasets we collected in the project and were trained to replicate the project research results. One USAID staff member participated in the workshop.

Three related M.S. degrees have been completed at the Department of Economics and Resource Management at the Norwegian University of Life Sciences. The theses focus on poverty dynamics and the role of forests. Journal articles were prepared from two of the theses. One student spent the spring semester 2010 at Purdue University as a visiting researcher and is now continuing as a Ph.D. student in Norway.

Malawi

We launched a household survey with 200 randomly-selected households in three southern Malawi villages in around Mulanje. A key element of the survey was a quarterly income questionnaire similar to the Poverty Environment Network (PEN) survey instrument. One main revision of the PEN format is the use of separate

interviews for husbands and wives in the income recording for the purpose of improving data completeness and accuracy. In rural Malawi, husbands and wives perform some income-generating activities separately and are often unwilling to share information on income generation in the presence of a spouse. In addition to the income recording, separate questionnaires were used to collect information on household demographics, landholding, wealth holdings, food security, expenditure shares for various goods and services, change in economic situation in the last five years, crises and unexpected misfortunes in the last three years (e.g., crop failure, serious illness of family member), change in forest use in the last five years, perceptions of forest values, willingness to participate in forest co-management, awareness of climate change, adaptation and response to changing climate, and receipt and use of agricultural input subsidies.

A series of economic experiments were used to collect information on householder risk attitudes and trust. In addition, geo-coordinates of all dwelling units and various locations of production and distribution were recorded. GIS data were acquired to develop a geodatabase to be merged with the household-level data. This longitudinal study studies agricultural strategies and social supports as they influence cropping and forest biodiversity in the presence of climate variability. In addition to household interviews, GPS and soil measurements were taken.

An additional household survey (n=400) was conducted in Kusungu and Liwonde districts of Malawi. This survey was a follow-up to 2002 and 2006 surveys. Our goal was to combine these surveys to construct a household panel, which we have done. The surveys formed the basis for thesis research by two students. The focus is the nexus between maize, tobacco and forest pressure. Our observations motivated a series of questions related to market- and policy-induced forest degradation, the role of institutions in shaping resource extraction patterns, and tradeoffs between short-term and long-term poverty alleviation. We also finalized research topics and a questionnaire for an 800-household survey being conducted by the Norwegian University of Life Sciences.

Data processing has been completed and data analysis is ongoing. The surveys include extensive information on household-level (idiosyncratic) and village-level (covariate) shocks and household response to these events. Three papers have been prepared. Two are in review at journals and one was presented in September 2010 at the annual meeting of the African Association of Agricultural Economists, in Cape Town. One policy brief has been created to summarize this work.

The training of our first M.S. degree Malawian student was completed in July 2010. The training of our second M.S. degree Malawian student is ongoing and is expected to be completed in 2011. Other training includes an “Ethics in Research” session conducted at Bunda College, University of Malawi. Participants included 18 males and 8 female staff members. We also completed a three-day training workshop for members of the Ministry of Agriculture and Food Security staff in Malawi. The title of the workshop was “Policy-oriented research for improved policy-making in Malawi.” It was conducted at the University of Malawi Center for Agricultural Research and Development included hands-on data analysis training using Stata and household data from Malawi. Participants included 26 males and 10 females. A follow-up workshop is planned for April 2011.

Core/cross-cutting activities

A global PEN database has been established, consisting of data from sites in Malawi, Uganda and 23 other countries. Work during the past year focused on getting the database ready for analysis by the end of 2010, and doing a preliminary analysis of an incomplete dataset. These results have been presented at several venues, including the World Forest Congress in Buenos Aires in 2009 and the IUCN World Congress in Seoul in 2010.

A major activity over the past year has been a methods book, entitled *Measuring Livelihoods and Environmental Dependence: Methods for Research and Fieldwork*. The manuscript will be published in March 2011.

FINDINGS

We examined a broad set of major shocks encountered by rural households in Uganda over a retrospective three-year period (2005-2008). We measured shocks in terms of their frequency and magnitude, focusing attention on shocks that can be most clearly identified as exogenous and unanticipated. Examining shocks in terms of their relative value enables us to exploit variation in losses across households to investigate the extent to which different coping strategies are used depending on the intensity of losses. We examined these issues using the household data collected in the

Masindi district, Uganda, where vulnerability most frequently takes the form of the loss of a productive household member or crop failure.

We found that, on average, such shocks result in income losses of 40% or more for many households. As in other developing regions, financial services and other institutions that might be used to mitigate losses are poorly developed. This limits the coping mechanisms available to households, especially those that are asset poor and headed by women. Because of a long history of migration into the study area the social and economic fabric of the area is weak. As a result, forest extraction constitutes an economically significant part of many households' livelihood portfolios, providing as much as 70% of subsistence and cash income in some villages.

Charcoal production in Uganda ranges from small-scale clandestine production to large-scale production in which large land holders who are establishing livestock ranches contract land clearing to urban charcoal traders who employ specialized work crews. Small-scale pastoralists trying to establish pastures may sell trees to charcoal burners who provide their own labor. These patterns suggest a complex dynamic relationship between charcoal producers and agriculturalists. In some cases, it appears that agriculture and livestock production is a precipitating factor in forest loss and in other settings that forest degradation is occurring as an independent outcome of household exposure to idiosyncratic risk. We found positive and statistically significant effects of participation in charcoal-related activities on household income and poverty levels, with income impacts of participation equal to approximately $1 per day. Charcoal production is especially important for households with low agricultural capacity and limited stocks of human and physical capital. In contrast to popular views and results from other studies, those engaged in charcoal production are *not* the poorest cohorts in our sample.

Profit margins in charcoal production in Uganda, including those for transporters and wholesalers appear to vary widely across locations and are weakly correlated with patterns of district-level law enforcement and regulation. Among 12 sampled producing villages, charcoal prices varied from a low of 83 shillings per kilo to a high of 200 shillings per kilo, suggesting that the point-in-time price variability for charcoal far exceeds that observed for many agricultural products. We find that approximately 70% of the value of the charcoal value chain is captured by intermediaries and traders. Margins among producers and retailers are generally small. These patterns indicate low barriers to entry for producers and retailers and some degree of market power among a relatively small number of intermediate agents.

We measured the impacts of Malawi's 2009 Farm Input Subsidy Program (FISP) on fertilizer use and maize yields in central and southern Malawi. We found positive and statistically significant correlations between participation in the FISP and intensity of fertilizer use. Fertilizer use is higher among households that plant improved maize varieties than among those that plant traditional varieties. We combined these results with those from a maize production function and found the program associated with an increase in maize availability of approximately 250kg per household in our sample.

The number of host country individuals trained at the degree level in the United States and Norway is nine in progress (33% female), and four completed (50% female). The number of host country individuals participating in non-degree training either inside or outside the host country to date is 142 (32% female). We contacted 84 policy-makers and high-level host-country stakeholders (NGO, research community, etc.) through project activities. Fifty research publications have appeared, and the project has been covered by media, both print and radio, in Malawi.

IMPACT EVALUATION OF THE *CRÉDITO FUNDIÁRIO* LAND REFORM PROGRAM IN BRAZIL:

A SIBLINGS APPROACH

Principal Investigators

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One of the Brazilian government's more recent responses to the question of rural poverty has been the *Programa Nacional de Crédito Fundiário* (PNCF, National Program for Agrarian Credit), a new branch of the National Plan for Agrarian Reform. The PNCF was first implemented through pilot projects in the late 1990s as a mechanism through which the landless can obtain land via the market. The primary objective is to promote the creation of productive activities, which will in turn increase the income and wellbeing of the rural population. The program works by providing subsidized loans to families or groups of families that together seek out and negotiate the purchase of land available through the market. Once the land is purchased, there are investments in infrastructure, credit for farming.

This new AMA project conducts an impact evaluation study of the PNCF. In addition to a broad evaluation of the impact of the program on the beneficiary's family income, we analyze the effect of the program on children. Considering the intergenerational transmission of poverty, impact evaluation of policy initiatives should evaluate the changes upon the youngest generations that may benefit from the program. The early childhood development hypothesis states that some degree of poverty will continue to be transmitted through generations if programs do not benefit the young. Specifically, with regards to the PNCF, we want to find out if children with land have better height-for-age z-scores than children without land. By extending the impact evaluation to the anthropometric data on the beneficiary children we can go beyond short-run measures of income and evaluate the program's potential long-term impact.

One could suppose that families that succeeded in obtaining land are more proactive than families that did not, and that these behaviors might be correlated with better parenting skills or increased investment in their children's human capital. To avoid this bias, the proposed methodology for this study includes a siblings comparison. In this way, unobserved family characteristics would be constant over siblings, and thus differenced out of the estimate of the impact of the program. It would be ideal to compare siblings such that one sibling was born before the acquisition of land, while another sibling was born after the acquisition of land. Comparison will be made not only between siblings, but also between control and beneficiary siblings, thus netting out the confounding influence of other programs such as the conditional cash transfer program *Bolsa Familia* that expanded rapidly in this period.

ACTIVITIES

During the past project year we gathered height data of sibling pairs in northeast Brazil, carried out qualitative interviews with *Programa Nacional de Crédito Fundiário* (PNCF) beneficiary families to obtain a better idea of the functioning of the program, and carried out qualitative interviews with state and federal level officials of the PNCF to better understand the administrative structure of the program, challenges, and obstacles.

We interviewed 1,343 families in the program, which is targeted at the poorest rural families—641 were beneficiaries of the program, and 702 were in the control group. The control group consisted of families waiting to receive land via the PNCF. All families interviewed in the baseline study can be considered pre-treatment, however, because beneficiary families were asked to report on the 12 months prior to receiving land on a recall basis. In this way, a difference-in-difference approach can be taken to analyze the effect of the program.

We measured 87.5% of the target families (see the table below). Target families were defined as families with two or more children that were surveyed as part of the larger study conducted by the University of São Paulo. An additional 2.2% were incorrectly coded and should not have been in the target sample. Thus, approximately 90% of families with siblings were measured.

The biggest obstacle to obtaining the heights of children was difficulty locating the families. Many times, the researchers would arrive in a municipality of a few thousand people with only the name of the head of the family they were looking for. Although every effort was made to locate families, it was sometimes necessary to abandon efforts to find a family and move on. Another obstacle to measuring the heights of sibling pairs was broken families, where the mother often times took the children to a distant city.

We conducted three qualitative interviews with state level PNCF administrators. In Bahia, the interview was with the director of the Coordenação de Desenvolvimento Agrário (Headquarters for Agrarian Development), the entity that manages the PNCF in the state of Bahia. In Ceará, the interview was with the coordinator of the Secretaria da Agricultura e Pecuária (Secretary of Agriculture and Livestock), the entity that manages the PNCF in the state of Ceará. In Rio Grande do Norte, the interview was with the coordinator of the Secretaria de Estado de Assuntos Fundiários, de Colonização e de Apoio a Reforma Agrária (Secretary of Agrarian matters, Colonization and Support for Agrarian Reform), the entity that manages the PNCF in the state of Rio Grande do Norte. We also conducted ten qualitative interviews with PNCF beneficiary families in the Northeast of Brazil.

Data on families with at least two children under ten in the Northeast

	Families	Percent
Total sample size	272	100%
Total measured by USP research team	80	29.4%
Total identified to be measured in return visit	192	70.6%
Lost because incorrectly coded	6	2.2%
Lost due to cost considerations[1]	9	3.3%
Lost due to inability to locate family	8	2.9%
Lost due to inability to finish route	5	1.8%
Lost due to broken family	4	1.5%
Lost due to family relocation	1	0.4%
Lost due to conflicts with association	1	0.4%
Total lost observations	34	12.5%
Total measured using grant from BASIS	158	58.1%
Total measured sample	238	87.5%

In the state of Minas Gerais we held numerous meetings with state level officials who work with the *Crédito Fundiário* program. The meetings provided insight into the workings, successes, and obstacles of the program in Minas Gerais.

We attended a meeting of the state level technical committee at which *Crédito Fundiário* proposals were presented for evaluation. The proposals were presented by local representatives, and many of the farmers seeking the loans were present to answer questions. If approved, the proposals are forwarded to the state level administrative body for final approval.

We met with the president of a municipal agricultural workers union in the southern part of Minas Gerais. He supported the proposals from his region that were being presented to the technical committee. We interviewed the executive secretary of the Conselho Estadual de Desenvolvimento Rural Sustentável (State Council for Sustainable Rural Development), which must approve each proposal in the state.

We interviewed the Director of the Unidade Técnica Estadual (the state level executor of the program in Minas Gerais), the Secretary of Agriculture of Minas Gerais, to discuss political perceptions of the program in Minas Gerais, and the president of the agricultural extension agency in Minas Gerais in order to better understand its participation in the program.

We also met with the following representatives in charge of the program at the national level.

- Secretary of Agrarian Restructuring in the MDA, at which we discussed the evolution of *Crédito Fundiário* and prospects for continued growth. We also discussed possibilities for collaborative research in 2011.
- Director of the PNCF, during which he explained the administrative structure of the program, the relationship between the state and federal governments as regards the program, and the experience as Director of the UTE in the state of Piauí.
- Advisor to the PNCF, who is in charge of solving operational and logistical issues.
- Director of planning, monitoring, and evaluation inside of the Secretary of Agrarian Restructuring in the MDA. This is the main contact person at the MDA who is overseeing our impact evaluation study of PNCF. We discussed the research, current challenges for the program, and possibilities for additional collaborative research in 2011.
- Technical staff for the program in the MDA. Roger had participated in the field research for our project in 2007. He demonstrated new software that was being developed to increase the efficiency of the administration of the program, and greatly reduce the amount of paper that flows back and forth between the state level executors of *Crédito Fundiário* and the federal government.

FINDINGS

No analysis has yet been made with the siblings data. A general impression from all of our conversations with state and federal *Crédito Fundiário* program administrators is that they are concerned that the group nature of the program in the Northeast—targeted at the poorest farmers—is not working as well as the component of the program that provides loans to individual farmers, and is accessible to slightly better off famers. Initial data analysis by the University São Paulo researchers seems to confirm this impression. It is possible that the program will be modified to eliminate group loans.

DOES INTERNATIONAL CHILD SPONSORSHIP WORK?

A SIX-COUNTRY STUDY OF IMPACTS ON ADULT LIFE OUTCOMES

Principal Investigators

Bruce Wydick: University of San Francisco

Paul Glewwe: University of Minnesota

Laine Rutledge: University of Washington

Additional support

Private donors ($15,000), University of San Francisco ($35,000).

Outputs

Wydick, Bruce, Paul Glewwe, Laine Rutledge. 2010. "Does International Child Sponsorship Work? A Six-Country Study of Impacts on Adult Life Outcomes." http://usf.usfca.edu/fac-staff/wydick/csp.pdf.

ACTIVITIES

BASIS funding allowed us to carry out surveys in India and Kenya related to our impact study of child sponsorship. In India, from February to April 2010, the investigative team obtained a household data sample of approximately 1,600 individuals. This study focused on three small towns in southern India and in two neighborhoods in Bangalore.

In rural Kenya, April to June, a larger survey of 3,300 individuals was carried out, in which we obtained data on adult life outcomes. Our sample frame included a population sample of formerly sponsored children who had been enrolled in the years of the local Compassion Project and all of their siblings. In addition, we randomly surveyed 50 to 75 households in each Compassion Project village, conditional on the presence of an individual in the household born in the ten years before the Compassion Project began operation, along with their own siblings.

To get our sample of treated individuals, we obtained enrollment lists in the years village projects began during 1980 to 1992. In some projects these lists were kept on an electronic database at the country office, and in others the lists had been filed away at the projects themselves and kept in hard copy. We used enrollment lists of children in the first two to three years of the program. Some projects started on a large-scale, enrolling up to 100 children in the first year. Other projects started with a smaller number of children, enrolling only 20 to 30 children in the first year. For the larger projects, we randomly selected individuals from the enrollment lists to be surveyed. For the smaller projects, we surveyed a population sample of the children enrolled in the first years.

In order to locate formerly sponsored individuals on the early enrollment lists, we hired local assistants, who were paid with our BASIS funding. These individuals were typically recommended by project staff, and were known to be responsible, well-respected members of the community. They were also individuals who had been raised in the village and were knowledgeable about the community. Through the help of these local assistants, we were able to locate all but a few households in Uganda, Guatemala, and Kenya, and a slightly lower fraction in the other three countries. Overall, we were able to locate 93.5% of the families of formerly sponsored children found on early enrollment lists when the Compassion Project began in their village.

We also obtained a random sample of non-Compassion families within the treatment villages and in one village adjacent to or nearby to each Compassion village without a sponsorship program. These households were selected through the following randomization rule: A starting point in the village was randomly chosen, and then every third household was selected to survey. The household was surveyed if an individual in the house met the aforementioned age criteria. When we reached the end of the street or block, we turned left and continued with every second or third household, then turned right and proceeded in this way, beginning with a new random point in the village on different days. This same randomization technique was used in the control villages. This is how our survey progressed in village after village.

Our survey obtained basic information regarding level of formal schooling, type of employment, age at marriage, number of children, whether or not the sibling holds a church or community leadership position, construction material of his or her home, and ownership of basic consumer durables such as a cell phone, bike, motorcycle, or automobile, as well as home and land ownership. All questions were designed to be simple and discrete in nature in line with our empirical approach that sought to identify the basic life outcomes of adult individuals that would be common knowledge between family members.

In the case of formerly sponsored children, we interviewed all available family members jointly in the household regarding the life outcomes of the formerly sponsored child and siblings. We obtained data on the primary person answering the questions—the mother or father 36.6% of the time, the formerly sponsored child 35.8% of the time, a sibling (22.4%), or another relative (5.2%). We found no statistically significant effects on impact variables by category of main respondent.

This data was then entered from hard-copy surveys into an excel database, and then loaded into Stata for data analysis over the following months at the University of San Francisco.

In order to investigate the factors behind our impact results, we carried out a much smaller study among

278 teenage children in our final three countries. We began with a short initial study with 30 children in India, then among 90 children in Kenya, and finally among 158 children in Bolivia. Among this group of teenagers, 127 were currently sponsored children, 70 were siblings of sponsored children, and 81 were random children of the same age in the same villages. Because of the heavy emphasis of the Compassion Project on self-esteem building, character development, and enhancement of self-expectations, we carried out a short survey to test for differences in these characteristics between currently sponsored children and non-sponsored children. This exercise was not a planned part of our research, but what we found was that reference points regarding vocation and education appear to play a strong role in the effectiveness of the child sponsorship program.

FINDINGS

We have completed the six-country study. Our household survey data cover 10,144 individuals in Uganda, Guatemala, the Philippines, India, Kenya, and Bolivia. The following summarizes our main results.

International child sponsorship is one of the leading forms of direct aid from households in wealthy countries to needy children in developing countries. Our research estimates that 8.36 million children are supported currently through formal international sponsorship organizations.

We find large and statistically significant impacts across most of our impact measures from the child sponsorship program. Our more modest OLS household-fixed-effect impact estimates indicate that over the six countries and 10,144 individuals in our study, sponsorship lead to:

- 1.53 years of additional schooling
- 19.6 percentage points greater probability of secondary school graduation
- 7.1 percentage points greater probability of white collar employment
- $16.65 increase in monthly income
- 7.3 percentage point increase in the probability of sending remittances back to family
- marriage at 0.65 years later in age
- reduced early-age female fertility
- significantly positive impacts on the probability of being an adult community leader, and of construction quality and electrification of the house in adulthood.

Household fixed-effect estimations that take into account that needier children within a family may have been more likely to be selected for the program indicate larger impacts:

- 2.42 years of additional schooling
- 32.6 percentage points greater probability of secondary school graduation
- 17.3 percentage points greater probability of white collar employment
- $37.88 increase in monthly income
- 8.0 percentage point increase in the probability of sending remittances back to family
- marriage at 1.71 years later in age
- similarly positive impacts on the probability of community leadership, yet slightly lower impacts on dwelling quality.

We find evidence in some of these variables of significant spillovers to younger, unsponsored siblings, particularly in the area of secondary school completion, where younger siblings of sponsored children are about 12 percentage points more likely to complete secondary school in both OLS and IV estimations. We also find evidence of positive educational spillovers to other children in Compassion villages from non-Compassion families that appear to account for about an additional 0.43 years of education per sponsored child.

The results of this study may have important policy insights: the transformation of reference points and self-expectations among children in developing countries may be strong complements to the provision of educational and economic opportunities.

USING LOCAL FOOD AID PROCUREMENT TO TRANSFORM RELIEF INTO DEVELOPMENT:

MARKET INFORMATION AND FOOD INSECURITY RESPONSE ANALYSIS

Principal Investigators

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Richard Mbithi Mulwa: University of Nairobi

This research has three objectives:

- generate useful market information and food insecurity response analysis (MIFIRA) baseline information in major regions of two East African countries where USAID and other donors are frequently engaged in humanitarian response to acute and chronic food insecurity
- develop and implement a scoring system to use with the MIFIRA framework
- develop MIFIRA training materials and "train the trainers" so as to promote dissemination of this framework within the region.

Collaborations

This project builds on a completed USAID Internal Capacity Building Grant to CARE (Office of Food for Peace, Bureau of Democracy, Conflict and Humanitarian Assistance, U. S. Agency for International Development and CARE. In 2007, Cornell, in collaboration with Tufts University and CARE, developed the MIFIRA framework. Cornell then collaborated with CARE-US to identify market assessment strategies for CARE. Fieldwork in Malawi, Ethiopia, and Bangladesh with CARE country offices assisted in this effort.

The Strategic Analysis and Knowledge and Support Systems (SAKSS) food security project funded the International Livestock Research Institute and Cornell from September 2008 to December 2009 to refine the MIFIRA framework within the context of the arid and semi-arid lands regions in eastern and southern Africa and to undertake a baseline market analysis in northern Kenya. The project's findings informed how the MIFIRA framework can best reflect the unique attributes of pastoral livelihood systems and their markets.

Outputs

Lentz, Erin and Christopher Barrett. "Draft Training Materials on MIFIRA: A Market Information and Food Insecurity Response Analysis Framework." May 2010. Full course materials including PowerPoints, syllabus, and spreadsheets for data analysis.

Michelson, Hope, Mitchell Morey, and Laura Cramer. 2010. "Results of the Market Information and Food Insecurity Response Analysis (MIFIRA) Framework Conducted in Two Locations in Kenya."

Mude, Andrew, Robert Ouma, and Erin Lentz. "Responding to Food Insecurity: Employing the Market Information and Food Insecurity Response Analysis Framework in rural Northern Kenya." Under review at the *Journal of Development Studies*.

ACTIVITIES

During the winter and spring of 2010, we developed a half-semester Masters-level course and accompanying lecture notes and presentations on the MIFIRA framework. We taught this course to Cornell University graduate students, a subset of whom were then selected to work with our field partners and academic affiliates to collect baseline data and write a synthesis of their findings. The lectures and presentations from the Cornell course are the backbone of training materials, which our academic affiliates will use when offering the "train the trainers" courses. These will be offered in Kampala and Nairobi during 2011, and open to students as well as practitioners.

Our local market contact in Mbale giving us a tour of the market. In this picture, maize is offloaded and supplied to a trader. Photo by Arnold Xavier.

During the summer of 2010, MIFIRA was deployed in two countries, Uganda and Kenya, where Cornell graduate students partnered with our local field agency partners, CARE and CRS, and local academic affiliates to generate baseline studies using the MIFIRA framework, field test the training materials, and collaborate with and train staff in response analysis using MIFIRA.

Preliminary findings from the Kenya and Uganda surveys have been shared with our local partners and the Kenya report is complete. The data will be used to develop and test a scoring mechanism that will aid in identification of treatment and control communities in any future impact evaluations. A University of Rochester graduate student in computer science also joined the Kenya team. She is working on developing a computerized natural dialogue system that will support collection of household level data.

We have begun developing a community scoring mechanism and an empirical demonstration of the response analysis scoring mechanism. We are using the MIFIRA framework to identify best-bet transfer options for responding to acute food insecurity; and, when food aid is the preferred option, to identify best-bet source markets for local or regional procurement in regions.

Ten Cornell University graduate students completed the MIFIRA "train the trainers" course held at Cornell during the spring of 2010. Seven graduate students received additional training by undertaking survey design, fieldwork in Kenya and Uganda, and analysis during the summer of 2010. The graduate students worked with each country office to develop a basic price monitoring system.

The academic affiliates from each country received training in operationalizing MIFIRA. Each academic affiliate participated in survey design discussions, contributed to enumerator trainings, attended field research in at least one site, and provided comments on preliminary findings. Their participation in these activities is complementary to their use and revision of the MIFIRA training materials for their upcoming courses.

The academic affiliates will train local students, staff, and other interested parties during 2011. This will involve a MIFIRA training or course, utilizing the training materials developed during the spring of 2010. These courses will incorporate lessons learned from the spring 2010 MIFIRA course offered at Cornell University. We expect that eventually the

MIFIRA training materials can be used as stand-alone technical guidance.

One preliminary findings workshop was held in Uganda and one kick-off workshop and one preliminary findings workshop were held in Nairobi, involving local PVOs, UN officials, and other stakeholders in the research design and dissemination of findings. PVO staff and enumerators were trained in the MIFIRA approach and trained in enumeration techniques.

FINDINGS

The project is at a half-way point. To date, the main results are as follows.

First, many of the Cornell-based training activities are complete. We are now transitioning to supporting our academic affiliates as they roll out MIFIRA training courses at their institutions. Their experiences teaching this course and the feedback they provide will assist us as we revise the training materials in the summer of 2011.

Second, the baseline surveys are complete and preliminary findings have been shared. At least one agency (Catholic Relief Services in Kenya) is using these findings to develop its programming strategy. Students are continuing to work with data from these surveys and they intend to develop papers for peer-reviewed publications.

Third, the analytical tools developed in MIFIRA are in demand from a variety of operational agencies, from the World Food Programme and FAO, to NGOs such as Catholic Relief Services, CARE and Mercy Corps. Many components of MIFIRA are being directly applied by NGOs undertaking analyses as an input into proposals for USDA funding for local and regional procurement pilot program funds. This project has enabled refinement of the MIFIRA toolkit and training materials so that others can put these tools to work sooner and with greater confidence and effect.