



BASIS

Assets and Market Access

Collaborative Research

Support Program

AMA CRSP

Annual Report

October 2007-September 2008



BASIS AMA CRSP



AMA CRSP

Department of Agricultural and Applied Economics
University of Wisconsin–Madison
424 Taylor Hall, 427 Lorch Street
Madison, WI 53706 USA
basis-me@facstaff.wisc.edu
tel: +608-262-5538
fax: +608-262-4376
<http://www.basis.wisc.edu>

STAFF

Michael Carter, Director
Eliza Waters, Assistant Director
Kurt Brown, Publications and Outreach Manager

USAID COGNIZANT TECHNICAL OFFICER

Lena Heron
Phone: (202) 712-0391 Fax: (202) 216-3579
lheron@usaid.gov

BASIS
Assets and Market Access
Collaborative Research Support Program

AMA CRSP

Annual Report

October 2007-September 2008

AMA CRSP

Department of Agricultural and Applied Economics
University of Wisconsin-Madison

<http://www.basis.wisc.edu>

May 2009

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.

All views, interpretations, recommendations, and conclusions
expressed in this document are those of the various authors and
not necessarily those of the supporting or cooperating organizations.

Copyright © by **AMA CRSP**. All rights reserved.
Readers may make verbatim copies of this document for noncommercial purposes
by any means, provided that this copyright notice appears on all such copies.

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>

Contents

	<u>Page</u>
The BASIS Approach to Development: The Director's Review of the AMA CRSP	v
AMA Research Theme: <i>Insurance and Risk Management</i>	1
Micro Health Insurance in Rural Cambodia: Evaluation of the impact on incomes, agricultural productivity and asset accumulation	3
Understanding the impact of idiosyncratic shocks on farm productivity and household assets in Ethiopia, Ghana and Bangladesh	11
Weather Insurance, Price Information and Hedging: Financial initiatives to help the poor manage agricultural risk (India)	17
A Productive Safety Net for Northern Kenya's Arid and Semi-Arid Lands: The HSNP+ Program	21
Area Based Yield Insurance for Peruvian Coastal Agriculture The Demand for Weather Insurance by Small Scale Cotton Farmers in Peru	27
AMA Research Theme: <i>Smallholder Access to Markets</i>	35
Access to Modernizing Value Chains by Smallfarmers in Indonesia and Nicaragua	37
Contracting Out of Poverty in Peru: Experimental Approaches	41
Enhancing Smallholder Competitiveness in the Face of Globalization (Guatemala)	47
AMA Research Theme: <i>Access to Finance</i>	55
Understanding and Improving Financial Access for the Poor (Ghana)	57
Biometric and Financial Innovations in Rural Malawi: A Field Experimental Approach	63
AMA Research Theme: <i>Asset Building and Pathways from Poverty</i>	67
Cash Transfers, Risk Management, and Asset Accumulation: Policy evaluation for rural poverty reduction in Nicaragua	69
Pathways for Ensuring Access to Assets: Land Reform and Beyond (Liberia and Uganda)	73
AMA Research Theme: <i>Sustainability and Use of Natural Resources</i>	79
Natural Capital and Poverty Reduction (Malawi and Uganda)	81

AMA CRSP: Where we work



THE BASIS APPROACH TO DEVELOPMENT: THE DIRECTOR'S REVIEW OF THE AMA CRSP

THIS IS AN EXCITING TIME as the BASIS Assets and Markets Access Collaborative Research Support Program (AMA CRSP) has begun to blend a program of pilot projects and interventions into an ongoing research agenda on the causes and consequences of rural poverty.

Beginning in 2001, BASIS began a series of basic research projects in eastern and southern Africa that probed the nature of chronic and persistent poverty. Much of this work had important conceptual elements, and while seemingly abstract, laid the groundwork for what some have come to recognize as the “BASIS approach to chronic poverty.”

The BASIS approach is predicated on two theoretically-grounded understandings. The first is that poverty dynamics and chronic poverty are best studied through the analysis of assets (the resources that people have to produce a livelihood) rather than through the analysis of income or other livelihood outcomes. The second is that there may exist a critical minimum asset threshold—the “Micawber Threshold”¹—and individuals whose assets fall below that level become mired in chronic poverty, unable to escape from that position over time. This theoretical work in turn led BASIS researchers to undertake empirical analyses of various economies (Ethiopia, Kenya, Madagascar, Malawi, South Africa, and Zimbabwe) in an effort to identify the Micawber or dynamic asset poverty threshold.

From a policy and programming perspective, knowledge of the existence and location of such critical asset thresholds is vital. It can be used to identify those households where risk has its most deleterious consequences. It can inform the design of safety nets intended to offset those consequences. Finally, it provides a target at which asset building programs can aim in order to achieve sustainable poverty reduction.

When the new BASIS/AMA CRSP was initiated in 2006, a fraction of the budget was set aside to seed

and fund an ambitious agenda of pilot projects designed to relax the constraints and change the conditions that underlie chronic poverty. The February 2009 AMA CRSP “Escaping Poverty Traps” conference held in Washington presented some of these new pilot programs. One is an asset protection insurance program for pastoralists in northern Kenya. If it works as designed, this new program will slow the collapse of families into chronic poverty and will enhance incentives for families to work their way out of poverty.

A second program, under design in Mozambique, aims to create a mix of smart fertilizer subsidies and enhanced savings instruments that will allow poor, near-subsistence farmers to reach the point at which they can sustain the financing and adoption of new technologies.

A third program is a novel effort to fine tune the delivery of food aid, choosing among food aid procurement modalities (local, regional and international) in order to both maximize impacts in source communities and guard the assets of those in recipient communities by assuring that food aid arrives before asset depletion places affected households in a trap from which they cannot escape.

These programs are being implemented with a state-of-the-art impact evaluation methodology so that we can reliably learn about their effectiveness. All will be implemented with support from either USAID missions or USAID initiatives such as Food for Peace. Most importantly, all represent a new generation of programming intended to crowd-in private initiative and savings.

While we will only find out the effectiveness of these and other AMA CRSP pilot programs over the next few years, they illustrate the logic of USAID’s investment in long-term social science research. The creativity of the interventions, their tight integration with new conceptual thinking, and the sophistication of their impact evaluation designs is what USAID needs to sustain itself as an effective leader and donor. These are not the kinds of things USAID can obtain in any other way except by engaging the creativity and out-of-the-box thinking that is found within our universities. The complexity of chronic

¹ The “Micawber Threshold” label is due to a paper Michael Lipton who used it to denote a level of poverty so deep that it could not be extinguished even by the virtue of incremental savings espoused by Charles Dickens’ character Wilkins Micawber (*David Copperfield*).

poverty in countries aided by the Initiative to End Hunger in Africa (IEHA) demands no less.

In addition to these pilot projects, BASIS continues to allocate most of its budget to competitively selected projects. These projects, which include impact evaluations of new interventions as well as more basic research into the fundamental causes of rural poverty and agricultural growth, include researchers from 34 US universities and overseas partners. Together with the pilot projects, these research projects come together to form the five-pronged AMA CRSP agenda:

1. Insurance and Risk Management
2. Smallholder Access to Markets
3. Access to Finance
4. Asset Building and Pathways from Poverty
5. Sustainability and Use of Natural Resources

Theme1: Insurance and Risk Management

- 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

Understanding risk and its effects on farmers is crucial to development in the agricultural sector. Earlier BASIS research on risk management and finance revealed that many farmers may engage in lower risk, lower return production strategies to avoid taking loans that they could not repay in the event of crop failure, illness, or other shocks. Researchers realized that if farmers were given tools to help them manage their risk, then they could improve their production strategies and incomes. It was from this idea that the AMA CRSP started working on several projects in the area of innovative agricultural insurance products.

Two pilot projects are teaming with private insurance companies to help bring new insurance products to

market. The first is an area-based yield insurance for farmers in Peru, and the second is an index-based livestock insurance for pastoralists in Kenya. In both cases, years of research are being put into creating products that are financially viable for insurance companies and offer real risk protection to farmers.

AMA CRSP researchers are also working in India to test the effects of the provision of index-based rainfall insurance to smallfarmers, to see if it can improve production decisions. In a complementary intervention, farmers are also being provided information on futures pricing to help them make harvest and storage choices. The project hopes that access to these products and information can improve the risk management strategies of smallfarmers.

The projects above deal with covariate risks that affect all farmers in a region. Yet there is growing concern that idiosyncratic, or individual-specific, risk is also highly troublesome for rural families. In fact, idiosyncratic risk appears to dominate covariate risk in rural incomes in Africa and Asia, indicating the potential that improved local risk management of idiosyncratic risk can lead to household asset accumulation, productivity growth and poverty reduction.

AMA CRSP researchers are carrying out studies in Ghana, Ethiopia and Bangladesh to better understand the impact of idiosyncratic shocks on farm productivity and household asset building and protection. The goal is to determine which households are better protected by various insurance mechanisms, which will allow for information to policymakers about gaps in insurance coverage, who is truly vulnerable, and what factors help mend the holes in the social safety net.

Another project looking at the problems of idiosyncratic risk is one in rural Cambodia, which is doing a rigorous impact assessment of an ongoing microhealth program being piloted in several areas. Research indicates that negative health shocks can drive households into a poverty trap from which they cannot recover. The insurance being studied both helps cover major medical expenses and encourages use of public health clinics. In addition, it is hoped that the program will improve public health facilities by providing a consistent income stream.

Findings and progress this year:

- A new insurance product called AgroPositiva was offered to cotton farmers in Peru. A total of 196

hectares are now covered by this insurance. Extensive training games, a marketing video, and print materials were used to help improve farmer understanding of the product and increase take up.

- The private firm partnering with AMA CRSP researchers is working on offering the new insurance product to cotton farmers in other areas, and is discussing the development of a related product for maize. Strike point, pricing, and payout structures were all developed with the use of AMA CRSP research.
- In Kenya, financial literacy games have been played to help farmers understand the nature of a new livestock insurance product. In collaboration with private sector partners, the real insurance contract will be launched and offered for sale in September 2009.
- In Cambodia, researchers are looking at who buys insurance, and will use this information to help design health insurance products that are financially sustainable. Researchers discovered that some of the marketing techniques have attracted applicants who are more likely to have health problems. This adverse selection will have to be corrected before the program can successfully be scaled up.
- Financial literacy is a key component of the success of any new insurance activity. This has proved true with health insurance as well as the innovative agricultural insurance products. In order for any of these to be successful, people have to have full understanding of how they work, both to encourage take up, and to decrease the risk of dropout if the insurance does not immediately pay out. AMA CRSP researchers have been working extensively to develop innovative methods for literacy training, including experimental games.

The AMA CRSP hopes that the take up of new insurance products will continue to increase, and that private firms will begin to scale up these pilot activities. The impact of this insurance can improve production by allowing farmers to undertake higher return strategies without worrying about risk causing them to lose everything. Helping farmers stay out of the poverty traps generated by negative shocks can benefit them for generations to come. Insurance helps protect their most valuable assets, and provide a more secure livelihood for their families.

AMA CRSP research has the ability to introduce new products to the financial market, share methods of financial literacy training, and do evaluations to see what products have the greatest impact. This information will allow the private sector to then provide these much needed products in various contexts around the world.

Theme 2: Smallholder Access to Markets

- Access to Modernizing Value Chains by Smallfarmers in Indonesia and Nicaragua
- Contracting Out of Poverty in Peru: Experimental Approaches
- Enhancing Smallholder Competitiveness in the Face of Globalization

Market conditions in a rapidly globalizing economy are changing dramatically every day. In order for farmers around the world to survive, they need to learn to navigate and participate in these changing markets. The goal of this line of research is to identify constraints to market participation, analyze changes in different value chains, and examine how smallholders adapt to market conditions.

This is a relatively new line of inquiry for the AMA CRSP, and currently most projects are collecting baseline case study data. While this data is relatively specific, the hope is that a deeper understanding of the way smallfarmers interact with new types of markets and marketing will give insight into what types of projects and programs could lead to greater integration of smallholders into globalized markets in the long run.

Current AMA CRSP research is looking at innovative contract structures for farmers in Peru with the goal of identifying contract types that can improve farmer welfare. Researchers have partnered with several private firms that deal with high-value crops to test a variety of new contract types and identify those that are most promising.

In Nicaragua and Indonesia, researchers are looking at modernizing value chains, including the increasing prevalence of supermarkets, and examining how smallholders are included or excluded from these new market channels. The project will identify factors that influence the changing value chains, and provide input to policymakers about how these changes might better serve smallfarmers.

AMA CRSP researchers in Guatemala are looking at coffee cooperatives in Guatemala to gauge how new

market options such as fair trade and organic coffees impact small producers. The project uses institutional data to understand the complex nature of coffee contracts, with the goal of identifying ways in which small producers can benefit more from high-value coffee exports.

Findings and progress this year:

- In Guatemala there are advantages to not joining a cooperative, and many farmers also would prefer not to have to sell to exporters. New types of organizations may prove a better way for smallfarmers to increase income from coffee.
- In Nicaragua researchers now have a much better understanding of the value chains of three key horticultural products. They are particularly interested in whether or not smallfarmers can sell to supermarkets, and have collected information on which farmers are able to sell to supermarkets, which products to sell, whether to sell directly or through an intermediary, etc. Greater understanding of the role of supermarkets will help farmers integrate themselves into modern food systems.
- In Peru researchers have partnered with a firm that buys mangoes. The firm is helping them pilot several contract designs, and is collecting monthly information on input use to see how different contracts affect production decisions. Monitoring of participants will continue over the next two years.

The overall goal of these projects is to help identify ways in which smallfarmers can be better included in modern horticultural value chains. Participation in high-value exports and specialty products such as fair trade or organic produce have the promise to greatly increase farmer incomes. Understanding the ways in which both market activities and certifications result in the inclusion of smallholders may help a larger percentage of smallfarmers to benefit from these new avenues. Additionally, cooperation of researchers with both producer organizations and private firms will allow the findings from these activities to be fed directly in to different components of the value chain for maximum impact.

Theme 3: Access to Finance

- Understanding and Improving Financial Access for the Poor (Ghana)
- PILOT: Biometric and Financial Innovations in Rural Malawi: A Field Experimental Approach

BASIS researchers have been working on issues related to financial markets for many years. Earlier research showed that lack of access to credit had a marked impact on production and income, meaning that improved access to financial markets could dramatically improve farmer welfare. Research identifying constraints to participation in financial markets and the subsequent impacts has led to more detailed research about the types of innovations that could help ease these constraints and make finance more available particularly to smallfarmers. The innovation of insurance products described above is one way to improve access; however, there are other types of innovations that can also open up these markets. The research aims to identify financial products or policies that could improve take up of loans and farmer productivity, or have other positive impacts. The AMA CRSP has one long-term research project focusing on the foundations of demand and supply of finance, in order to develop innovative new products and lending practices that can improve access. The hope is that by better understanding some of the limitations to credit from a very practical point of view, changes in lending practices can be made that will both increase the supply of credit and improve the financial stability of lending institutions.

The AMA CRSP has also funded a pilot project in Malawi that provided biometric monitoring using fingerprinting to gauge the impact on lending and repayment practices. The use of new technologies to solve this and other problems holds promise for improving the supply of finance.

Findings and progress this year:

- Fingerprinting appears to decrease loan size in the lowest quintile, decreasing adverse selection in the loan portfolio, which is good for lenders.
- Use of fingerprinting also seems to affect both crop choice and input use, indicating that farmers are making greater efforts to repay in cases where they were fingerprinted prior to receiving loans.
- In Ghana, research found that door to door marketing was not an effective tool for recruiting new credit clients, even when paired with interest

rate incentives. Other methods should be sought to improve the outreach of loans.

- Very high take up of a crop insurance product offered in conjunction with credit allowed farmers to make profitable investments in their crops. Preliminary data indicate a role for financial literacy training, since those with less education were less likely to take advantage of a product that included price indemnity insurance.

AMA CRSP researchers are working closely with private sector partners to offer new types of financial products. The findings from the research will help the lenders both identify new products that can help improve take up and repayment rates, as well as increase the number of rural households that have access to credit. The relationships formed give an obvious outlet for research findings, and mean that products and innovations can continue to be refined in a way that improves both supply and demand for credit. Access to additional capital will allow farmers to make more profitable production decisions and improve their long term wellbeing.

Theme 4: Asset Building and Pathways from Poverty

- 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)

For many years BASIS researchers examined the role that assets play in a household's ability to stay out of poverty traps and improve its situation over time. Under the BASIS CRSP, the idea of an asset threshold was developed, with research indicating that households that fell below a particular level of asset holdings were likely to get stuck in a poverty trap from which it would be difficult to escape. AMA CRSP researchers are following up on this by looking at different government programs and interventions related to the provision of assets to see which have the most promise for improving livelihoods.

In Nicaragua, AMA CRSP researchers are looking at a government program that provides conditional cash transfers to see what impact this has on household risk management and asset accumulation. The project used initial findings to identify and design complementary interventions that might improve the effectiveness of the transfer. The project hopes to

understand the long-term impacts of the program, which will inform the design of other conditional cash transfer programs.

AMA CRSP researchers are also working on assessing access to land, particularly for women, in Liberia and Uganda. The project assesses the current state of land tenure through community surveys and interviews in Uganda, and through consultation with the government in Liberia. By comparing two countries in different phases of the land reform process, the project can use lessons from Uganda to inform the ongoing process in Liberia, resulting in better and more secure access to land assets.

Findings and progress this year:

- Conditional cash transfers were found to have a positive impact on the cognitive development of young children. Additionally, expenditures on preventive health care and nutrient-rich foods, both of which improve development outcomes for children, increased by more than the amount of the cash transfer, indicating a change in parental behavior. Both of these are strong positive outcomes.
- There is the potential for even greater impact by further involving female leaders, since proximity to these leaders impacted investments and asset accumulation by recipient households.
- There is a wide variety of tenure structures in southern Africa, and many times landholders themselves are not sure of their status. Greater understanding and organization could improve the security of tenure.
- Women feel particularly vulnerable about their landholdings. Much of the tenure system is dependent on marital status, and their rights are in question in the case of death or divorce.

AMA CRSP researchers are in an excellent position to directly inform ongoing policy decisions regarding asset programs. The goal is to use the findings from these projects to help design new policies for maximum effectiveness. In Liberia, a Land Commission will become operational in 2009, and researchers will work closely with it on the evolution of land policy in the wake of civil war. In Nicaragua, a complementary pilot on Early Childhood Development will be conducted this year. Researchers will continue to work with the relevant government bodies on the creation of social programs that can best help the nation's poor.

Theme 5: Sustainability and Use of Natural Resources

- Natural Capital and Poverty Reduction (Malawi and Uganda)

The livelihood of many of the world's rural poor is dependent on the use of natural resources. It is important to allow households to benefit from the use of these resources while promoting sustainable use. BASIS CRSP research looked at payments for environmental services, where households were rewarded for engaging in activities that promote environmental protection, and to see who benefited most from the implementation of these programs.

An AMA CRSP project looks at how households use access to common pool resources to manage negative shocks, and whether extraction activities can be used as a pathway out of poverty. The project focuses on the use of forest resources, particularly for charcoal production. This project also is dedicated to training students and researchers.

Findings and progress this year:

- There may be market- and policy-induced forest degradation, as researchers observed considerable leakage of fertilizer subsidies from maize to tobacco. This shows how important it is to look at the potentially wide-ranging impacts of agricultural policy.
- At Makerere University, a training course on the ethical conduct of research was given for students, staff and enumerators. This is a unique offering, and will promote collecting reliable data without negatively impacting research subjects.

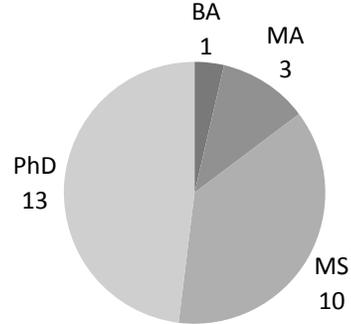
This project hopes to inform policy debates in both Uganda and Malawi so that rural households who depend on natural resources as part of their survival can continue to use them in a sustainable manner. As climate change becomes an increasingly important concern, informing the debate in how to balance use and preservation of forest resources is critical. Complete understanding of how and why resources are used will allow our researchers to provide this vital information to stakeholders.

AMA CRSP TRAINING AND PARTNERSHIPS

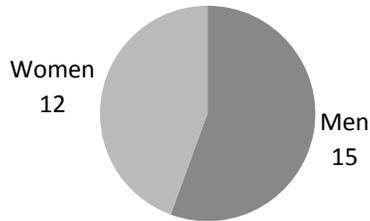
These charts show the training carried out by the AMA CRSP. In the 2008-09 period, AMA CRSP trained 27 students.

Of the total, 12 are women and 15 are men.

Students Trained



Trainees by Gender

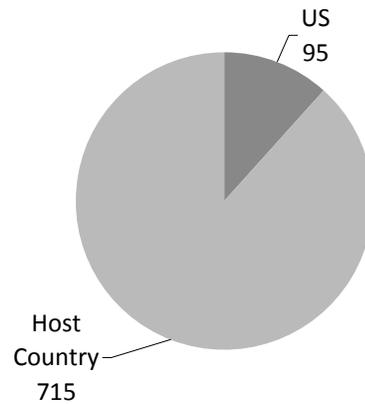


AMA CRSP also engaged in extensive, ongoing short-term training, with 810 people receiving short-term training in the 2008-09 period. Nearly 90% of those trained are from the host countries where research projects are being carried out.

Countries of citizenship for AMA CRSP trainees 2007-2008

Australia	India	Nicaragua
Canada	Indonesia	Peru
Ghana	Malawi	Uganda
Great Britain	Mexico	USA
Guatemala		

Short Term Trainees



AMA CRSP U.S. Based Research Partners

Cornell 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 - San Diego
University of Michigan
University of Wisconsin - Madison
World Bank
Yale University

AMA CRSP International Research Partners

Center for International Forestry Research
(CIFOR)
Central American University
Centro de Investigación y Acción Educativa
Social (CIASES)
Domrei Consulting
Grupo de Analisis para el Desarrollo
Indian Institute of Management - Calcutta
Institute of Statistical, Social and Economic
Research (ISSER)
Instituto de Estudios Peruanos
International Livestock Research Institute (ILRI)
Makerere University
Norwegian University of Life Sciences
Padjadjaran University
Royal University of Phnom Penh
Universidad Rafael Landivar
University of Ghana - Legon
University of Liberia
University of Malawi

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

- 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. 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.
Spanish version available: *Asegurando a los que nunca estuvieron asegurados: Explicando el seguro por índice a través de juegos de educación financiera*.

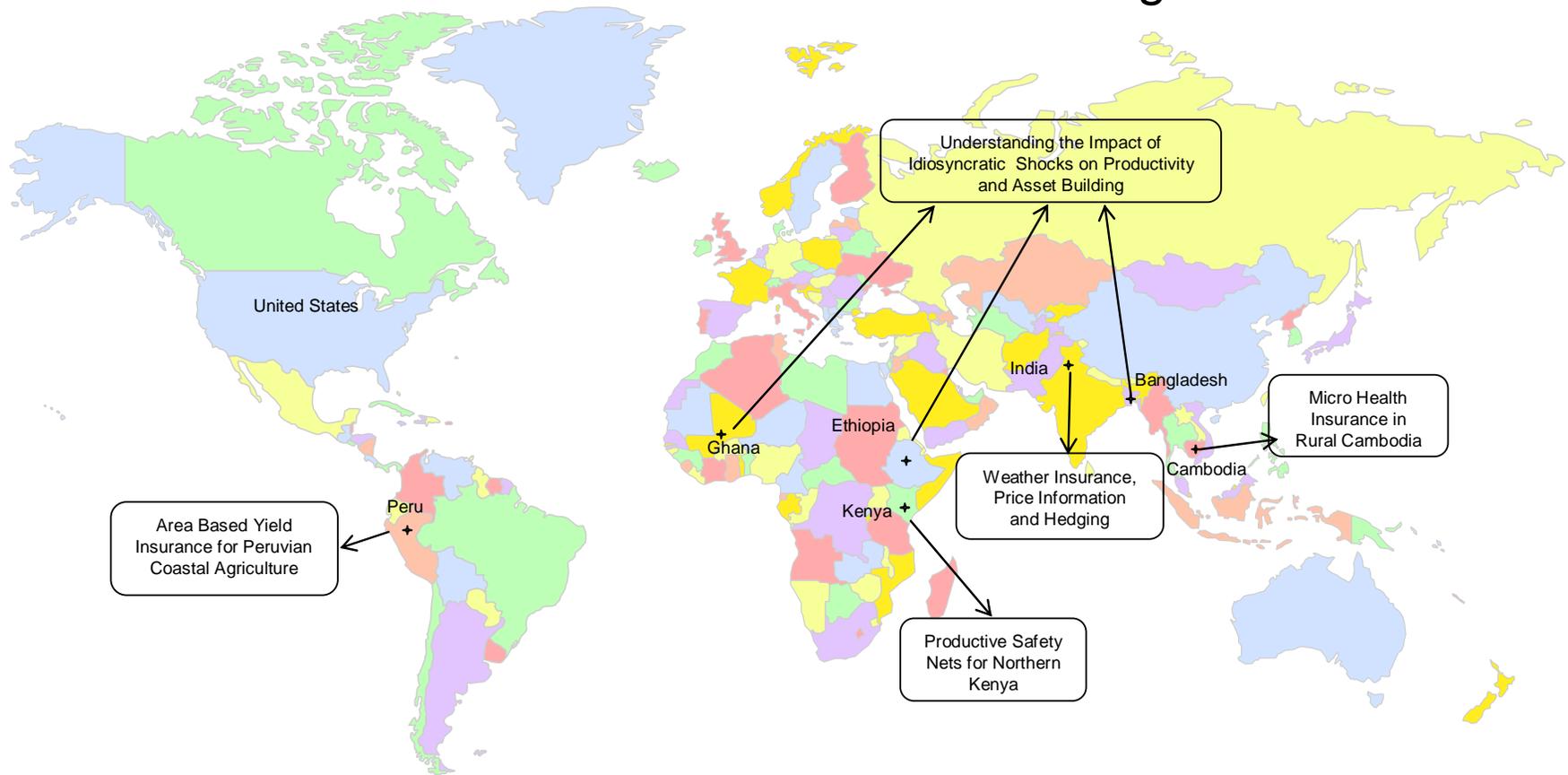
BASIS Brief no. 2008-01. *Weather Insurance, Price Information, and Hedging: Helping the Poor Manage Risk*, by Shawn Cole, Raghendra Chattopadhyay, Stefan Hunt, Jeremy Tobacman, and Petia Topalova. January 2008.

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



MICRO HEALTH INSURANCE IN RURAL CAMBODIA: EVALUATION OF THE IMPACT ON INCOMES, AGRICULTURAL PRODUCTIVITY AND ASSET ACCUMULATION

Principal Investigators

Nhong Hema, Royal University of Phnom Penh, Cambodia

David I. Levine, University of California–Berkeley, USA

Ian Ramage, Domrei Consulting, Cambodia

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

THE WORLD'S RURAL POOR HAVE THE HIGHEST RISKS of ill health and the lowest rate of health insurance. The result is that injuries and illnesses—and the resulting loss of income and health care expenditures—often push households into poverty and lead them to sell productive assets. Rigorous evidence of a causal impact on health and economic outcomes is scarce. There are few, if any, experimental studies of adverse selection in health insurance markets, and studies using natural experiments or econometric methods have had mixed results in demonstrating adverse selection. New theories of selection into insurance have developed, yet there are few empirical tests of these competing theories.

In Cambodia, in 1998, a French NGO launched a health insurance program called SKY (“Sokapheap Krousat Yeugn,” which in Khmer means “Health for Our Families”). Funded by donors but with plans to become financially self-sustainable, SKY’s goal is to provide protection from catastrophic health expenses, while also encouraging the use of public health facilities that meet minimum quality standards.

Despite the potential for great benefits from such a program, very little is known about the ability of micro-insurance programs to improve health and economic outcomes. We are evaluating the effectiveness of SKY to analyze several important questions:

- Are those with high risks more likely to buy insurance? If so, is this an obstacle to a financially sustainable private health insurance market?
- What insurance prices and contracts minimize adverse selection, promote financial sustainability, and improve outcomes for the poor?
- Is health insurance a good way to increase health outcomes?
- Is health insurance a good way to decrease the vulnerability of poor populations?

This project provides rigorous evidence on the effectiveness of micro-health insurance on the ability of the rural poor to protect their economic wellbeing and livelihoods while maintaining access to quality healthcare.

Additional outputs

“Final Evaluation Design,” by David I. Levine, Ian Ramage and Nhong Hema. December 2007.

http://www.basis.wisc.edu/documents/Final_Evaluation_Design_Cambodia.pdf

ACTIVITIES

Surveys. The central methodological tool of our evaluation is the use of randomization of insurance premium levels to vary treatment conditions among households within a village. Price is varied via a “Lucky Draw” contest administered at village meetings.

We carried out a pre-intervention baseline survey of approximately 3,000 households with over 12,000 individuals. Follow-up surveys of the same households will be conducted over the four-year project period. The survey covers the multiple areas that the health insurance program attempts to influence: health, asset vulnerability, investment and saving decisions, and risk management.

Qualitative interviews. We conducted telephone interviews with 26 SKY insurance agents (IAs) and member facilitators (MFs) to determine how they market SKY, what induces households to join and drop out of SKY, and in general to learn more about SKY operations on a day-to-day basis. We also asked IAs and MFs how the 2007 pilot Lucky Draw village meetings affected operations, and whether people had complaints about the process.

We conducted in-depth interviews with nine respondents in three villages located in the Ang Roka district, in Takeo province. Five respondents were SKY members and four were non-SKY members (two of the non-SKY members had joined SKY but dropped out). The purpose of the interviews was to better understand why households did or did not join, or dropped out of SKY, and to learn their opinions of the Lucky Draw lotteries. We also asked questions that would inform our baseline quantitative household survey.

Clinic surveys. These surveys were administered in 23 health centers (HCs). This sample represents all HCs serving the areas in which SKY conducted village meetings from November 2007 to May 2008. HCs are spread across three operational districts: Ang Roka (10 HCs), Koh Thom (7 HCs) and Kampot (6 HCs) in the provinces of Takeo, Kandal and Kampot, respectively.

In addition to these 23 HCs, a second wave of the baseline clinic survey was administered to all HCs associated with SKY villages in which village

meetings took place. (SKY partners only with HCs that meet a certain standard of quality. Thus, the interviewed facilities are likely to be of better quality than the average rural Cambodian public facility.)

Review of administrative records. We used SKY records to measure take-up and drop out rates of households with large and small coupons, and to compare basic SKY demographics to those of households in the 2005 Cambodian Demographic Health Survey (DHS). SKY keeps track of utilization of health facilities by SKY members,



AMA researchers interviewed families to discover why they did or did not take up health insurance. Photo by Ariella Leafer.

which we used to compare utilization of SKY buyers with large and small coupons, and to measure how much utilization of health care influences the choice to drop insurance.

FINDINGS

Through the qualitative interviews we learned what type of person was likely to buy insurance and the roles of IAs and MFs in the SKY marketing process. We found that IAs and MFs often first market to households that they know can afford SKY, and to households that have a sick household member. MFs, who spend part of each day at HCs, often sell SKY to households who visit the HC.

Thus, the marketing of SKY may be encouraging selection into insurance by households that are more likely to need health services. While this is positive from a humanitarian point of view, this adverse selection into the program will make it difficult for SKY to become financially sustainable.

Households that join SKY more likely to be “middle” income: they have enough money to afford SKY but are not so rich that they would prefer to visit more expensive private health facilities. Distrust of insurance in general, distrust of public facilities, and inability to pay the premium were listed as three reasons some households choose not to buy insurance. Many households do not understand how SKY works, which may decrease take up and increase drop out. Indeed, households will drop out of SKY if they find they have not used health services, since they then believe that the premium was a waste of money. Households also complain that they are not treated well at public health care facilities, and that necessary drugs are sometimes unavailable.

We found that following the village meetings with the Lucky Draws, IAs would visit households who won the large coupons first, with some saying they visited only large coupon households. We also asked whether households that won the coupon were any different than those that did not. The general consensus was that they were not, since the Lucky Draw was a random process. About half of those interviewed thought low coupon winners were upset that they did not receive a high coupon, while the other half thought people were not resentful because they knew the process was random.

We feared that renewal rates would be low among high coupon winners, since households may not be willing to pay a higher price once they got used to the reduced rate. However, IAs did not report that renewal rates were affected negatively by the coupon; instead, households that renewed were those that were satisfied with SKY. As a result of these interviews, we concluded that we would need to give IAs incentives to visit all households in our survey sample following the village meeting, so that all households would have equal opportunity to join SKY. We also decided to test renewal coupons, which gives an additional three-month discount to high coupon winners if they sign up for an additional six months.

Households that bought SKY reported their main motive as the health benefits or the funeral benefit (SKY provides a small stipend for a funeral in the event of a death in the household). The biggest complaints were about the public facility: respondents reported that staff members did not pay attention to them, and that patients were not given the pills they needed. Another complaint was that SKY sometimes collected fees a few days before they were due, and households were not prepared to make this early payment.

-
- **The current tendency to market insurance to individuals who already visit health facilities is an example of adverse selection that makes it difficult for an insurance program to become financially self-sustaining.**
 - **We feared that those receiving a high coupon for taking health insurance might not be willing to pay the normal price for insurance once they were used to the reduced rate. Yet, renewal rates were not affected negatively by the coupon.**
 - **Creating incentives for insurance agents to visit all households will give more households an opportunity to join SKY.**
 - **Many families without health insurance reported that they would pay for a health expense by selling an animal or land.**
 - **44% of those receiving high coupons for health insurance purchased insurance, and 72% were still in the program seven months later. Conversely, only 3% of those receiving low coupons purchased insurance, yet 49% were still in the program seven month later. Both types of households used the health facilities at roughly the same rate.**
-

Households that never joined SKY reported that the premium was too high. Households that dropped out also listed inability to pay the premium as the main obstacle to renewal. Most households reported that without SKY, they would pay for a large health expense by borrowing money from a relative or neighbor, while others would sell an animal or land. On the theory that households who exhibit risky health behaviors may be more likely to buy SKY insurance, we asked which behaviors were considered risky. Drinking, poor hygiene, improper

food preparation, self-treatment for illness, and delivery of a child at home were listed as risky behaviors, among others.

Clinics. In our clinic surveys, we focused on systematic observations by SKY MFs, which SKY hires to be present at facilities and manage client complaints and questions. MFs typically work mornings at each HC. Since these MFs work for SKY, and because they interact often with HC staff, it is possible that their responses reflect a desire to portray both SKY and the HC in a positive light. The current survey sample shows that most MFs (over 57% for all measures) report an improvement

hours a day. Yet, almost a quarter of facilities were open only in the morning on weekdays; a few of those were open longer hours on Saturday. One facility closed for a day and a half due to lack of supplies.

The MFs received permission from HC officials to examine drug stock. With the exception of artesunate/mefloquine (to treat malaria), drugs were mostly in stock. However, only 39% had all 12 surveyed drugs in stock, with four HCs (17%) missing one item, seven HCs (30%) missing two items and three HCs (13%) missing three items. No HC was missing more than three.

MFs reported aspects of HC cleanliness. Only two HCs were clean and hygienic by all five measures used in this survey; 87% of facilities did not have soap available for hand washing, 65% had floors that needed mopping, 35% had garbage around the center, 13% had overflowing garbage bins.

The following equipment were present at the facility: sink in treatment room (78%), running water (78%), special bin for syringes (100%), baby weighing scale (100%), manual vacuum/aspiration kit (4%), electricity supply (87%), basic delivery kit (91%), and a functioning cooling system for vaccine (100%).

These data describe just a few dozen HCs at a specific time based on a single information source. Member facilitators report increases in perceived quality, but quality remains far from perfect. For example, HCs are not open as many hours as official standards require, and it is unclear if staff have access to the facilities need to keep the center sterile.

Client take up and retention. Preliminary evaluations of SKY take up data show the following results. Out of the 1,342 households that received a large coupon, 596 (44%) purchased SKY insurance. Of the 195 large coupon households that joined before January 2008, 72% were still SKY members seven months later, implying a 28% dropout rate.

Out of the 1,342 low coupon households in our randomized sample, 40 (3%) purchased insurance. Approximately 130 households not chosen for our survey sample also bought insurance using a low valued coupon. Of the 61 low coupon households



in waiting time, cleanliness, staff politeness, doctor services, and staff absenteeism since the MF began working at the facility. Staff politeness and doctor services decreased in quality at only one health facility. (Note that MFs may not be familiar with the health facility conditions prior to SKY's affiliation with the facility.) Some 83% of MFs report that households pay "thank you" payments to doctors at least some of the time.

MFs were asked to report actual hours of operation over the course of one week. Facilities were open an average of 16 hours per day, six days a week. Slightly over half the facilities were open over 18

that joined before January 2008, 49% were still members seven months later, implying a 51% dropout rate.

The fact that households with high coupons did not drop out at higher rates is beneficial for our impact evaluation. The 28% drop out rate among high coupon buyers is along the lines of SKY historical dropout rates, yet it is interesting to note that the small sample of low coupon households dropped out at a higher rate than usual for SKY households.

Looking at utilization data, we find that households that won high coupons have approximately the same utilization rate over the first six months as those that won a low coupon. For example, around 50% had a member visited a HC at least once but not a hospital, and around 20% visited a hospital at least once.

Retention of SKY members was higher for households that had used health services at least once, especially among low coupon households. While 49% of low coupon households stayed with SKY after six months, only 18% stayed with SKY if they had not used health care services in the past six months. For high coupon households, 72% stayed with SKY in general, but only 61% of those who did not use care stayed with SKY after six months. The fact that non-use does not severely decrease retention among high coupon buyers implies that the high coupon group may represent a more diverse risk pool, a positive for financial sustainability. We will look into this more deeply.

When we compare SKY households' demographic characteristics to those of households in a 2005 survey, preliminary evidence shows evidence that a select type of household joins SKY. In particular, SKY households seem more likely to have a household member over the age of 60 than households from the earlier survey, with around 10% and 7%, respectively, over age 60. Again, we will explore this issue in depth.

CAPACITY BUILDING

Undergraduate courses. Courses in research and evaluation began at the Royal University of Phnom Penh (RUPP) during this project year. These cover evaluation methodology and prepare students to run their own rigorous evaluations of programs in Cambodia. Two one-semester courses were developed and taught with assistance from BASIS. The aim is to develop knowledge and skills in

designing and conducting experiments, writing an adequate and acceptable research report, as well as evaluating existing and future research. Overall, 136 undergraduate students have benefited from this capacity building support. The course has proved very popular and yielded demonstrable improvement in understanding of research design.

Internships. Earning a small salary, 28 young Cambodian researchers took part in pre-testing, fieldwork and ethical training, interviewing, anthropometric measurement and data entry and cleaning. This valuable practical experience in conducting research to a high standard will continue to provide a benchmark for these young



A village delivery room. Respondents report improvement in cleanliness and doctor services at health centers, yet 87% of health centers did not have hand soap. Photo by Ariella Leaffer.

people in their future research careers.

Undergraduate thesis prizes. RUPP ran a competition to select three final-year students who elected to undertake their thesis on a topic related to the SKY evaluation. The winning students received a grant from the project to assist with the fieldwork for their theses. We are currently summarizing and translating these interesting theses to share with BASIS, SKY, AFD and other stakeholders.

Graduate student course. We began a semester-long course on rigorous evaluations for UC-Berkeley graduate students. Details at <http://www.ocf.berkeley.edu/~garret/decal.html>.

WHAT'S NEXT?

DEVELOPMENT GOALS

1. Determining the characteristics of health insurance that appeal to potential buyers. This is useful in setting up culturally appropriate health insurance schemes in developing countries. Our qualitative surveys of households will shed light on this issue.
2. Determining the type of people benefiting from health insurance, and whether the target population benefits. The baseline household survey will give us information on the type of people that enroll in insurance, and the baseline and follow-up surveys can show us whether these people benefit from the program.
3. Determining whether the current SKY insurance methodology is working as intended. Understanding strengths and weaknesses of this particular program will help voluntary micro-health insurance projects in other parts of the developing world as well. By examining utilization patterns of SKY members versus non-members, we can see whether members are overusing care, or whether adverse selection is an issue in financial sustainability. Interviews with IAs give us insight into how the SKY program is marketed, and whether their marketing methods are appropriate for targeting members while still ensuring risk pooling.
4. Understanding how families cope with negative health shocks, and how insurance changes that behavior. Our household surveys will allow us to compare coping strategies of households before and after insurance, and allow us to compare coping strategies of SKY members versus non-members.
5. Understanding whether voluntary health insurance is a viable option in a development setting, given the risk of adverse selection. Our baseline survey, along with information on utilization collected from SKY records, will allow us to measure the extent of risk pooling, and thus will give us insight as to the financial viability of the program.

ANTICIPATED ACTIVITIES

Village monographs. This survey will interview households from approximately six villages in which SKY has been operating for many years. The survey will ask questions on motivations for buying insurance, utilization of insurance, reasons for dropping out of insurance, and opinions of SKY. The same households will be visited at endline to ask similar questions. In this way, we will be able to track health changes over time and get an idea of how families deal with health shocks. We also aim to examine the spread of SKY over time. For example, how do experiences of one family with SKY influence the purchasing decisions of other families in the village?

Baseline survey of health facilities. This survey will measure the baseline state of health facilities. Health care staff will be asked their opinions of SKY and how it has affected the way the health facility functions. We will extend our research on clinic quality with a longitudinal follow-up of the HC survey and analyses of HC quality from the household survey.

First follow-up survey. The first follow-up survey will be designed and then implemented in two waves. The timing of the survey will be such that households will be interviewed 8-12 months after the start of SKY, and six or nine months after the baseline survey, which will enable us to measure short-term impacts of SKY.

SKY data. Several times a year we will receive all accounting and health care utilization data collected from applicants and HCs. The data will include records of insurance purchases and renewal from SKY IAs, and records of health care utilization from SKY or HCs. We will combine this information with results from village meeting lotteries and survey results to analyze impacts of insurance and take-up behaviors.

Capacity-building activities. Courses in research and evaluation will be taught to undergraduates at RUPP. These courses will be in evaluation methodology, and will be taught with the hope that students of these courses may one day run their own rigorous evaluations of programs in Cambodia.

Internships. RUPP students will have the opportunity to serve as interns at Domrei Research and Consulting, in both data collection and analysis, giving them hands-on experience with rigorous evaluation techniques.

Executive-level course on rigorous evaluations, and evaluation and research training for RUPP faculty. Two week-long courses will be taught by the PIs in Phnom Penh.

Course at Berkeley on rigorous evaluations. We will continue a semester-long course at UC-Berkeley: “Global Poverty and Impact Evaluation: Learning What Works for the World’s Poor.”

ANTICIPATED OUTPUTS

- Report on the first round of health facility surveys
- Technical report on the first round of household surveys
- Selection report describing determinants of SKY take-up
- Policy brief on selection, which will be translated into Khmer and sent to Cambodian ministry officials.

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

Principal Investigators

Ernest Aryeetey, Institute of Statistical, Social and Economic Research, Ghana

Christopher B. Barrett, Cornell University, USA

Agnes Quisumbing, International Food Policy Research Institute

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

IN AFRICA AND ASIA, IDIOSYNCRATIC RISK, which impacts only individuals or specific households, appears to have more impact on rural incomes than covariate risks, which impact virtually everyone in a community. This indicates the potential contribution of improved local management of idiosyncratic risk to household asset accumulation, productivity growth and poverty reduction in developing countries. In Bangladesh, long-term poverty is often caused by idiosyncratic shocks in the form of illness and injury. In Ethiopia, illness ranks as the greatest risk to long-term household welfare. Serious undernutrition of adults may trap a household in poverty as low nutritional status is highly correlated with subsequent low growth in consumption. In Ghana, idiosyncratic risk associated with illness, injury, theft and farm shocks are widespread and key determinants of current incomes. Recent findings suggest that socially excluded groups, such as new migrants and young farmers who don't belong to major clans, are least able to cope with such risks because they have minimal social networks to manage idiosyncratic risk through interhousehold transfers. Shocks appear to have persistent effects on their asset dynamics but not on those of better-connected and better-off neighbors.

In each country there are different primary mechanisms which can help households recover from individual shocks. We aim to enrich understanding of the role such institutions play and the dynamic gains from these idiosyncratic risk management mechanisms. The project focuses on:

- clarifying existing mechanisms that help households through episodes of adverse idiosyncratic shocks
- determining to what extent these mechanisms insure households against risk
- revealing how different interventions affect insurance against idiosyncratic risk and its impact on rural households' asset holdings, productivity and wellbeing.

In contrast to most existing empirical work, this holistic approach to studying household insurance mechanisms can provide information to policymakers about gaps in insurance coverage, about who is truly vulnerable, and what factors help mend the holes in the social safety net. We aim to establish whether some households are systematically better insured by some mechanisms than are other households, and whether asset stocks and insurance coverage co-evolve over time, reinforcing each other.

Additional outputs

Bhattacharya, 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>

Naschold, Felix and Christopher B. Barrett. "Do Short-Term Observed Income Changes Overstate Structural Economic Mobility?" http://amacrsp.aem.cornell.edu/Papers/Mobility_Naschold & Barrett_Dec2007.pdf

Quisumbing, Agnes R. "Poverty transitions, shocks, and consumption in rural Bangladesh: Preliminary results from a longitudinal household survey."

http://amacrsp.aem.cornell.edu/Papers/Consumption_poverty_transitions_Bangladesh_v3_oct07_final.pdf

Vanderpuye-Orgle, Jacqueline and Christopher B. Barrett. "Risk Management and Social Visibility in Ghana." http://www.basis.wisc.edu/documents/Risk_Management_and_Social_Visibility.pdf

ACTIVITIES

In Bangladesh, two phases of qualitative and institutional data collection were completed, both funded by CAPRi (Systemwide Initiative on Collective Action and Property Rights). The qualitative data collection built on completed life histories and examined the role of collective action (both formal NGOs and social networks) in helping households cope with shocks. The institutional data collection phase took place in April and May 2008

because NGOs only lend for program purposes (even if, admittedly, credit is fungible).

A paper on poverty dynamics in Bangladesh was finalized, and a draft paper on asset dynamics in Bangladesh written.

In Ethiopia, work began on the Ethiopian Rural Household Survey (ERHS) resurvey, which is scheduled to go into the field in 2009. Work also



Villagers from Pokrom, Ghana prepare to be surveyed. AMA researchers are gathering information from rural populations on community-based risk management. In Ghana, funeral societies and farming and church-related organizations appear effective in protecting the vulnerable against risk.

Photo by Christopher Barrett.

and focused on mechanisms used by households to cope with idiosyncratic risk.

Case studies were written, but analysis is not yet complete. The plan was to examine institutional mechanisms and modalities of relevant institutions that enable households to cope with idiosyncratic risk, but we decided to look at a broader range of coping mechanisms because survey responses showed that NGOs were not an important coping mechanism for households. This is probably

commenced on four papers. Building on earlier work that examined the impact of shocks on consumption, the first paper looks at the impact of idiosyncratic shocks on child labor. A second paper undertook preliminary work on the impact of long-term physical disability on poverty and poverty dynamics. A third paper linked two newly available sources of nationally representative household data, the 2004 Welfare Monitoring Survey and the 2004/05 Household Income and Consumption Expenditure Survey (HICES) to extend our earlier

analyses of the impact of idiosyncratic shocks on consumption and poverty. A fourth paper explores how best to target transfers of different asset types so as to maximize poverty reduction in the ERHS villages.

In Ghana, data collection began, focusing on generating a fourth round of a panel data set. We started the empirical analysis of quantitative and qualitative data already available. Outputs included descriptive analysis in the form of poverty transition matrices, descriptive statistics of all variables and plots of income, consumption and asset dynamics and their relation to idiosyncratic shocks and to targeting. A paper on asset dynamics and risk in rural was completed in time for the 2009 Ghana data collection.

In addition to these country-specific data analysis activities, the project team identified possible topics for the final, cross-country synthesis report to be produced in 2010. This early planning should strengthen the synergies between the three country case studies and improve the final synthesis report. We compared survey data questionnaires from the three countries in great detail so as to identify common questions and modules across the surveys as well as gaps between them. The gaps we identified, particularly in how the Ghana survey information on shocks differs from the other two countries, helped us redesign the survey instruments for data collection in Ghana and in Ethiopia in 2009.

OUTREACH

We used our extensive contacts with communities, different levels of government, and donors to stimulate discussion and bring attention to the goals of and range of policy lessons to be learned from this research project. A project website (<http://amacrsp.aem.cornell.edu/>) posts data descriptions, questionnaires, working papers, trip reports and briefing papers.

In Bangladesh, we took part in a high-visibility national conference to present the results of the poverty transitions analysis to various stakeholders. Community-level stakeholder meetings correspond to CAPRI's anticipated major workshop on gender and collective action (of which our study is a part).

In Ethiopia, results of the analysis of the WMS and the HICES was presented at a high level workshop

attended by the Minister of Finance and Economic Development, senior donor representatives as well as representatives from regional governments. We held a series of training and capacity building workshops on the analysis of poverty dynamics using household panel data. In addition, we completed a series of mentoring exercises designed to support junior Ethiopian researchers in their microeconomic analysis of shocks and poverty dynamics.

In Ghana, we held national and community-level stakeholder meetings and presented preliminary results based on the existing three waves of the



Headwomen of Oboadaka, Ghana. Photo by Christopher Barrett.

panel survey. Our project also helped sponsor a highly successful, two-day Young Economists Outreach Programme organized by ISSER and the Economy of Ghana Network. This event, attended by 76 persons, connected a number of accomplished, senior economists working on Ghana with some of the country's younger economists from universities, government ministries, and local research institutes, in order to build the younger economists' skills and contacts and promote the development of local economic analysis and research.

FINDINGS

In Bangladesh, our analysis of the determinants of intergenerational transfers and the association

between such transfers and the intergenerational transmission of poverty finds that women receive less schooling, land, and inherited assets than men, and also give up their inheritance to their brothers in exchange for economic and social support. While intergenerationally transferred assets, mostly controlled by the husband, increase levels of current assets and consumption, only the husband's schooling and inherited land, as well as women's social networks, help protect against chronic poverty. Examining the relationship between assets holdings, shocks and poverty, our longitudinal survey shows no evidence of poverty traps in the form of multiple dynamic equilibria. Results suggest concave asset transition paths and only limited evidence for multiple equilibria in the case of non-land assets. The existence of well-functioning markets for labor and capital, the absence of discrete differences in livelihood strategies, and the absence of exclusionary mechanisms in rural Bangladesh, and Asia more generally, may help explain the contrast between these results with those for several African countries in the existing literature.

In Ethiopia, we find that idiosyncratic shocks in the form of illness are associated with reductions in consumption, but they appear to have no effect on child labor. The death of an adult, by contrast, is associated with increases in child labor, but this appears to depend on the identity of the adult. The death of the spouse of a male household has a large, statistically significant effect on child labor, increasing it by approximately 16 hours per week. By contrast, deaths of male adult heads or other household members have little or no effect on this outcome. Further we find no impact of long-term physical disability on poverty and poverty dynamics. However, the prevalence of disability in our sample proved smaller than we first anticipated; as a result, we suspect that a lack of statistical power is behind our inability to find significant impacts of disability on poverty or consumption.

By combining two newly available nationally representative household data sets, the 2004 Welfare Monitoring Survey and the 2004/05 HICES in Ethiopia, we were able to extend our earlier analyses of the impact of idiosyncratic shocks on consumption and poverty. We find that illness shocks have a large, negative effect on adult equivalent consumption, reducing it by 8.9% in

rural areas and 19.4% in urban areas. Severe illness is associated with an increased likelihood that a rural household is poor by 9.9% and that an urban household is poor by 15.0%. Social insurance has the potential to fill the gap left by more formal financial markets. However, access to these social insurance mechanisms is not uniform.

In rural Ghana, risk management varies with the extent to which people are integrated into the social fabric of the village. We identify a subpopulation that comprises some 8% of villagers that is socially invisible. Socially invisible individuals tend to be younger, poorer, engaged in farming, recent arrivals to the village and have been fostered and are not members of a major clan. We find evidence for considerable risk pooling among the socially visible to the extent that individual shocks don't seem to cause large changes in consumption. In contrast,

-
- In Ethiopia, illness reduces household consumption but appears to have no effect on child labor. Social insurance helps reduce the impact but coverage is not uniform.
 - In Bangladesh, the male head's schooling and inherited land, as well as women's social networks, help protect against chronic poverty.
 - In Ghana, we identified a "socially invisible" subpopulation that is not protected from shocks by local risk management arrangements.
-

risk pooling is not evident 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. In a new synthesis paper, we provide an original and extensive overview of evidence on community-based risk management arrangements (CBRMAs) observed across the developing world. The latter 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.

WHAT'S NEXT?

In Bangladesh, data analysis will focus on the role of institutions in coping with shocks, and the role of collective action institutions in gendered patterns of asset accumulation. We will also begin analysis of individual level outcomes. During this project year, we will participate in a high-visibility national conference to present the results of the long-term impact of anti-poverty interventions analysis to various stakeholders. We will hold community-level stakeholder meetings during that period as well. CAPRI will also organize a research workshop on its gender and collective action program, with outreach planned to major stakeholders.

In Ethiopia, we gained a commitment from a consortium of donors to fund survey a new round of the ERHS in 2009. The survey will have three focal points: asset accumulation, including the impact of idiosyncratic shocks, impact of rising food prices, and impact of land registration on productivity.

We will complete our work on two papers: Poverty, asset dynamics and poor health, and on asset targeting. We will commence analysis of the new ERHS data collected in 2009.

In Ghana, data collection focuses on generating the fourth round of a panel data set. We will analyze poverty and asset dynamics in the existing three waves. Then we will start our econometric analysis of new data, including analyzing poverty and asset dynamics under idiosyncratic risk; and the roles of risk, social networks and participation in farming cooperatives.

We will continue developing the framework for synthesis work once we have all the data from all three project countries available for analysis.

TRAINING

In Ghana, degree training at Cornell will involve two Ph.D. students and one M.S. student. They will work with the project in data cleaning and analysis, preparation of the Ghana survey instrument for resurvey, and preparation of outreach materials. One of the Ph.D. students will participate in field data collection throughout 2009.

A post-doctoral researcher will develop and improve quantitative methods to model the interaction between idiosyncratic shocks and household welfare dynamics, analyze household welfare dynamics in Ghana and coordinate the synthesis research efforts between all involved research teams.

In Ethiopia, IFPRI and Addis Ababa University are participating in a capacity-building consortium led by the Ethiopian Development Research Institute that is related to this project. In the 2008-09 work year, we will continue with this work which includes:

- training Ethiopian researchers in application of “best practice” research techniques to the analysis of poverty
- mentoring by international experts of Ethiopians engaged in follow up empirical research in a learning-by-doing mode
- in-depth collaborative work between Ethiopian researchers and international experts
- workshops that disseminate and discuss the work emanating from this project.

ANTICIPATED OUTPUTS

- Working papers for Bangladesh on the determinants of formation of social networks and participation in NGOs, the impact of NGOs and other social networks in building assets, and the role of institutions in helping households cope with idiosyncratic shocks.
- Working papers for Ethiopia on poverty, asset dynamics and poor health, and asset targeting.
- Working paper for Ghana on asset and welfare dynamics and idiosyncratic risk.
- Policy brief on community-based risk management and policy implications.

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

Principal Investigators

Raghavendra Chattopadhyay, Indian Institute of Management-Calcutta

Shawn Cole, Harvard Business School, USA

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

OF 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 (average land holding size for marginal farmers is around 0.4 hectares). Such individuals are predominantly subsistence farmers earning thin margins after each harvest, and, as such, are often in debt. 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 negative aggregate income shocks. A drought or an unexpectedly low price for a main crop can harm an entire village.

This project, involving hundreds of rural villages across six districts in Gujarat, India, is developing a complementary pair of initiatives to address these risks. 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*. 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 will also 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.

These interventions hold practical promise. First, they are scalable and could be expanded to the hundreds of millions of people in India and elsewhere who derive a livelihood from agriculture. Second, they require no up-front capital investments. Third, rainfall insurance and futures price information and hedging are market-oriented initiatives that can be financially sustainable for the institutions that provide them. We evaluate the initiatives' efficacy with a series of a randomized field experiments.

Many farmers are wary of new financial products, and reluctant to use them as part of their investment strategies. Helping farmers understand the potential benefit of the products in the long term may help them move into levels of higher asset accumulation and significantly reduce their risk.

Additional outputs

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>

Cole, Shawn, Jeremy Tobacman and Petia Topalova. 2007. "Weather Insurance: Managing Risk through an Innovative Retail Derivative." Working Paper.

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#

Operations manuals on the Futures Price Information and Weather Insurance. Also an instructional video on futures markets.

ACTIVITIES

For the weather insurance project, we conducted a baseline survey. Our NGO partner, the Self-Employed Women's Association (SEWA), administered marketing treatments to over 3000 households in Ahmedabad, Anand and Patan districts of Gujarat. Marketing included distributing flyers and coupons, displaying informational videos on portable video devices, and conducting village-level informational meetings on rainfall insurance. Then a rainfall insurance product was offered through SEWA to a total of 52 treatment villages.

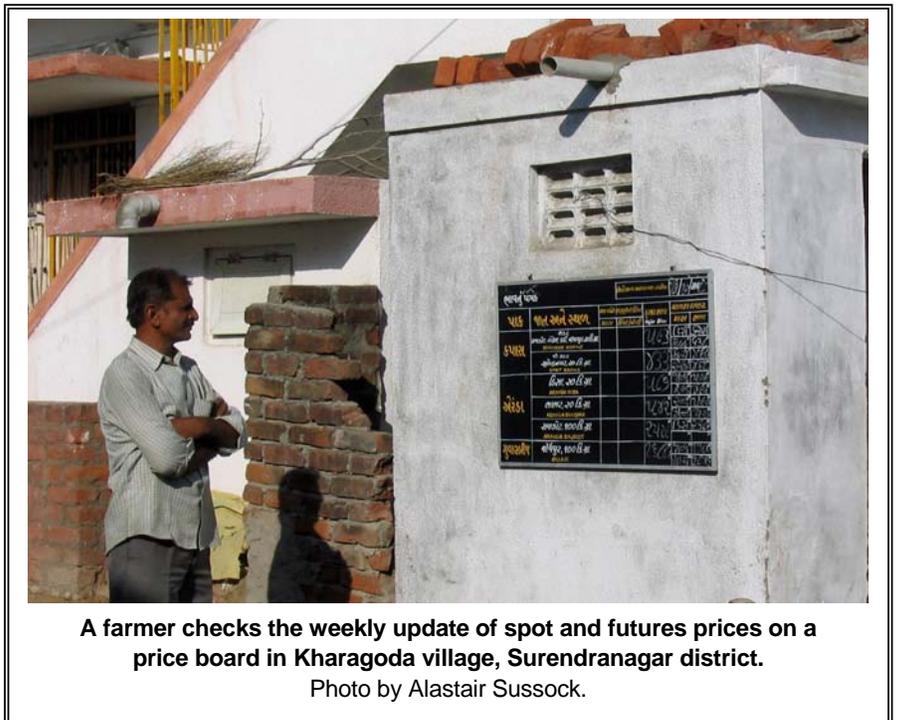
Owing to a normal monsoon, no payouts were made from the rainfall insurance product, limiting our ability to evaluate the impact of the product on consumption smoothing and asset accumulation. However we produced an academic paper focusing on insurance uptake entitled "Weather Insurance: Managing Risk through an Innovative Retail Derivative." A second paper, "Barriers to Household Risk Management: Evidence from India" was written in collaboration with another group of researchers who evaluated a similar product in the Indian state of Andhra Pradesh. These papers were presented at a number of academic conferences. Furthermore, we have written an operations manual to guide other parties interested in offering such an intervention.

For the price information/hedging (PI/H) project, a baseline survey was conducted. In collaboration with the National Commodities and Derivatives Exchange (NCDEX), training on futures and spot prices was delivered to respondents in Ahmedabad, Surendranagar, Mehsana and Vadodara districts of Gujarat. This included a 20-minute instructional video scripted by the research team, and shot in the field by a professional film crew. Also, price boards providing weekly commodity futures prices and spot prices for cotton, castor and guar seed were set up in the 54 PI/H treatment villages.

The household surveying allows us to establish the status quo situation of the respondents in our study, and the development and implementation of both the weather insurance and PI/H treatments will allow us to determine their impact.

KEY FINDINGS

Wealth, education, risk-aversion, and the ability to understand probabilities positively predict take-up of the rainfall insurance. We find no evidence that access to insurance or take-up immediately causes shifts into other production technologies. Marketing materials can influence take-up decisions, yet we find that households tend to purchase only one unit of insurance, no matter how large their risk exposure.



A farmer checks the weekly update of spot and futures prices on a price board in Kharagoda village, Surendranagar district.

Photo by Alastair Sussock.

WHAT'S NEXT?

Household resurvey. We will resurvey 1080 households in 108 villages as a part of the PI/H component of the project. The intervention at present consists of placing price display boards in each treatment village (54 villages in all) that carry

from the previous round of surveying. In allowing us to assess how farmers respond to price information, we can further understand how they manage risk and respond to risk management interventions.

Operating manuals. We will hire a Master's student from a local institution to develop operations manuals as guides for NGOs interested in providing price information and weather insurance to rural households. The manuals will detail best practices in delivering these interventions, through covering recommended methods for educating potential clients, advice and sample data on the cost of provision and a comparison of possible modes of implementation. The manuals will be developed together with SEWA, which will add valuable field lessons from its experience delivering the interventions.

Product design and delivery mechanisms. The research team will make its third site visit with a goal of refining product design and delivery mechanisms for both the weather insurance and the PI/H interventions. The team will work with NCDEX and SEWA to produce practical models that link farmers to futures markets, and communicate these models to regulators.

The team will be able to incorporate feedback from the previous rounds of surveying into the product design for weather insurance towards providing better risk management for policy holders. Furthermore, the development of models to link farmers to futures markets will allow for a gradual increase in the complexity of the PI/H

intervention with the potential to greatly increase the risk management capability of rural households.

Weather insurance. By recording take-up in the weather insurance project, we will be able to test and discover further determinants of take-up. Conditional on the occurrence of payouts from the insurance policy, we will be able to extend the



A survey respondent for the commodity futures prices project, ponders his expectation of the price of cotton in Juna Vadala village, Vadodara. In this “bean game,” the respondent must place 20 beans over 5 price ranges to indicate his or her expectation of the likelihood of the harvest time price falling within those ranges.

Photo by A. Niles Fernando.

the spot and futures prices for cotton, castor and guar. The prices are updated weekly through text messages sent to a price poster in each village.

The data collected will allow us to determine the impact of the intervention on price expectations and sowing decisions of respondents in the treatment group. This will be done by calculating difference-in-difference estimates using the data collected

literature by determining the effects of weather insurance on wellbeing through the measurement of household income and asset accumulation.

In coordination with the research team, SEWA will market the weather insurance product to households in the treatment group for the upcoming growing season. Additionally the second round of household surveying will be conducted. The key measures will be insurance take-up and the intended sowing decisions of farmers, which will allow us to see if the additional risk coverage provided by the insurance product leads to increased use of higher-risk, higher yielding crops.

By randomly assigning marketing treatments, we will be able to further test which marketing and educational strategies allow for optimal take-up and insurance coverage. Moreover, we will be able to compare the data collected on take-up to the previous round of household surveying to understand the reasons for successive take-up or attrition. Further comparison will allow us to evaluate the appropriateness of the weather insurance product towards risk-management, and the ability of farmers to adapt their decisions to such coverage.

A Ph.D. student at an Indian institution will be identified to write a paper on household demand for weather insurance using data collected from the study. The paper will be an important contribution towards an understanding of the obstacles preventing optimal take-up and coverage adoption by rural households. This paper will fill lacuna in the literature on microinsurance, namely, the importance of financial literacy in successful household risk management.

PI/H. We will continue to provide futures and spot prices to treatment villages. We will complete the second round of household surveying, which will allow us to capture the prices that farmers received for the crops they harvested, information on their yields, and the profit they earned. Additionally, we will collect data on price expectations and expected sowing decisions prior to the new PI/H intervention.

Collecting data on realized prices will allow us to observe whether the pre-harvest price expectations

of farmers in the treatment group from the last round of surveying were more accurate than those from the control group, once again using a difference-in-difference methodology.

Findings resulting from this exercise will allow us to evaluate the success of the PI/H intervention in allowing farmers to mitigate price risk through making more accurate price predictions and through a more optimal combination of crops. Additionally, it will allow us to assess the efficacy of financial literacy training—specifically as it applies to the use of futures prices—in understanding and mitigating price risk.

Trainers from the NCDEX will run sessions on how to utilize futures and spot prices in treatment villages. The training is intended to allow respondents to leverage the PI/H intervention more effectively. The effects of the training will be captured in the following round of PI/H surveying.

ANTICIPATED OUTPUTS

- “Barriers to Household Risk Management: Evidence from India.” This paper is being considered by the *Journal of Finance* and will be presented at professional meetings and in seminars at Duke and Michigan Universities.
- “The Real Effects of Financial Development: How Do New Markets Affect Investment Decisions.” Paper on the effects of futures markets.
- Operations manuals on how to offer the (a) futures prices information intervention and (b) weather insurance. The manuals cater to NGOs and other parties interested in providing a similar service and product.
- Short course on survey design at the Centre for Microfinance (CMF) in Chennai. The course will cover academic and practical themes, such as measuring consumption, trade-offs between length and quality of response, and incentives and supervision of enumerators. The target audience will be research officers of NGOs and MFIs in India, and will be identified through the CMF network.

A PRODUCTIVE SAFETY NET FOR NORTHERN KENYA'S ARID AND SEMI-ARID LANDS: THE HSNP+ PROGRAM

Principal Investigators

Christopher B. Barrett, Cornell University, USA

Michael R. Carter, University of Wisconsin, USA

John McPeak, Syracuse University, USA

Andrew Mude, International Livestock Research Institute, Kenya

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

IN KENYA'S ARID AND SEMI ARID LANDS (ASALs), drought is the most pervasive hazard, natural or otherwise, encountered by households on a widespread level. This is especially true for northern Kenya, where more than three million pastoralist households are regularly hit by increasingly severe droughts. In the past 100 years, northern Kenya recorded 28 major droughts, four of which occurred in the last ten years. For livelihoods that rely solely or partly on livestock, the resulting high livestock mortality rate has devastating effects, rendering these pastoralists amongst the most vulnerable populations in Kenya. As the consequences of climate change unfold, the link between drought risk, vulnerability and poverty becomes significantly stronger.

The Hunger Safety Net Program (HSNP) in northern Kenya provides reliable cash transfers to poor households. These cash transfers should improve the capacity of beneficiary households to meet immediate, essential needs and to invest in improving their future prospects by, for example, paying for children's school fees, health care, veterinary care or supplemental feed for stressed livestock. By increasing access to cash, the HSNP may also help stimulate the emergence and growth of non-pastoral commercial enterprises, generating employment and income for residents of the ASALs.

If access to funds were the only thing holding back poor households, the HSNP should suffice as a policy instrument for sustainable poverty reduction. Yet given the considerable risk faced by ASAL households, there may be considerable value-added from augmenting HSNP with a Productive Safety Net (PSN) aimed at insuring households' critical assets against catastrophic loss. We call this augmented program HSNP+, which can have three key effects: stem the downward spiral of vulnerable households into poverty, stabilize pathways from poverty through asset accumulation, and crowd in finance to spur investment and growth.

In the remote and infrastructure deficient areas of Northern Kenya, it is prohibitively costly to observe, verify and indemnify the losses experienced by individual households. Without massive subsidy, a conventional individual-based insurance scheme will simply not provide the sustainable protection needed to alter the dynamics that add to the ranks of the poor trapped in the ASAL of Kenya.

To supplement the PSN, an Index Based Livestock Insurance (IBLI) product has several advantages. Payouts are not based on individual outcomes but on an aggregate index (for example, average livestock mortality rates) that is correlated with individual outcomes. Using an index that is based on data that is promptly, reliably, and inexpensively available (and not manipulable by either the insurer or the insured), the insurance contract makes compensation payment to insured beneficiaries whenever the data source indicates that the index reaches the insurance activation level, or "strike point."

Additional outputs

Project Summary: Index-based Livestock Insurance for Northern Kenya's Arid and Semi-arid Lands: The Marsabit Pilot. http://www.basis.wisc.edu/live/ilbi_summary.pdf

Barrett, Christopher B., Michael R. Carter and Munenobu Ikegami. 2008. "Poverty Traps and Social Protection." <http://www.aae.wisc.edu/carter/Papers/BarrettCarterIkegami.pdf>

ACTIVITIES

Design of insurance. Insurance is an unusual commodity (we buy it and hope to get nothing in return). Index insurance is more complex than standard insurance. Unless households really understand the IBLI product, demand for it will be low and the expected behavioral responses will not take place. The mixed success of recent efforts to implement index insurance products in low income agricultural settings make clear that we need to devise methods to ensure an informed clientele for the product.

With this type of insurance there is the possibility that an individual loses livestock to death and yet, since the loss of livestock in the area is low, there is not payout to that individual. Conversely, when payouts *are* made because the index has been reached, there can be some individuals who benefit from the payout even though they lost no livestock. Known as “basis risk,” this sometimes imperfect correspondence between an individual’s experience and the index variable is a significant issue that we must account for in the index insurance product design.

We analyzed a series of potential indices that alone or in combination could be used to provide the best possible IBLI in terms of low basis risk, desirable data characteristics (timeliness, cost, non-manipulability, etc.), and product pricing and performance for vulnerable ASAL populations. Candidate indices can be roughly divided into two mechanisms:

Asset replacement insurance, which is a product that offers compensation for livestock losses. If based on a rainfall index, it would pay out in the case of a major drought, flooding, or both. If based on area average mortality, it would insure against livestock deaths due to any cause. The idea is to help affected households rapidly restock their herds, or facilitate entry into other productive

livelihoods, in the wake of a major shock. Different indices can be used and indemnity payments offered, either in cash or in kind, e.g., actual restocking of livestock.

Asset protection insurance, which encompasses products that are triggered preemptively in anticipation of a shock. Such a product uses historically valid leading indicators (e.g., the relation between forage availability or rainfall



Kenyan farmers play the index insurance game with BASIS researchers.
Photo by John McPeak.

during one period and livestock mortality in a subsequent period) to identify a trigger level of the index that generates payouts that can be used to protect the asset from loss expected in the absence of intervention. For example, using remotely sensed data on forage availability in rangelands, one can reasonably accurately predict upcoming livestock mortality. An index insurance product based on predicted mortality as a function of current forage availability could trigger indemnity payments that pastoralists could use to avoid losses. This index insurance scheme can generate payments either in

cash or in kind (e.g., vouchers for supplemental feed and/or water delivery that can cost-effectively keep threatened livestock alive through a drought).

There are important questions surrounding the availability of reliable, objective, low-cost data for establishing the index and determining when indemnity payments are due. We considered a design that uses an index of climatic indicators (rainfall and remotely sensed forage availability indicators based on normalized differenced vegetation index [NDVI]) that reliably predict average animal mortality. Because rainfall and NDVI are leading indicators of mortality, and available in advance of the onset of livestock mortality, IBLI based on these indicators could provide asset protection insurance.

Taking into account the need to keep basis risk acceptably low, we outlined a feasible set of insurance products. Our analysis indicates that insurance should cost less than US\$20 per Tropical Livestock Unit (TLU) per-year.

We found that satellite-based measures of vegetative cover can be used to precisely predict the average livestock mortality experienced by local communities. Importantly, the quality of that prediction is highest for more catastrophic events. Provisional predictions have 85-88% accuracy for average losses of 20% or more, climbing to 95-98% accuracy for average losses of at least 40%.

Therefore, we developed a predicted livestock mortality index based on vegetative cover indices. This will be used as the basis for an index insurance contract offered as a supplement in HSNP cash transfer program areas.

Design and pre-testing of insurance game.

A broad range of households should benefit from this index insurance contract: HSNP-eligible households that need a feasible incentive to help in the effort to escape destitution, vulnerable households at risk of a collapse into destitution, and better-off, HSNP-ineligible households.

National insurance companies and international reinsurance companies have shown high initial interest in this new product. However, it is essential that adequate time be taken with ASAL populations to familiarize them with the possibilities and risk associated with index insurance. To make the insurance product comprehensible to the never-before-insured, we developed a game that illustrates

how insurance works. We played the game with groups of people in five different sites: Karare, Dirib Gumbo, Kargi, North Horr, and Logologo. Building on lessons learned from earlier BASIS work in Peru, the game builds understanding of the concept and of specific prospective product designs. We will refine the design of index insurance products by testing target populations' behavioral response to the availability of such contracts.

Given the poverty trap logic that empirical research suggests applies in the northern Kenyan ASAL, one would hypothesize that both the asset protection and asset replacement safety nets would be most attractive to households with herd sizes at or near the critical asset threshold and vulnerable to falling below the threshold in the event of a shock. However, the products we will roll out should also offer important risk management value to individuals with large herd sizes wanting to simply protect themselves against substantial asset loss, as well as to households with herds below the threshold working to build their herd or simply protecting the critical, albeit meager, assets that they hold. In this way, the products themselves will be self-targeting—they can be offered to all wealth herd size categories and by the pattern of uptake we shall gain insight on the extent, nature and evolution of the dynamic asset threshold and the value it creates for asset protection mechanisms at different levels of herd size across various household level determinants.

For this program to be commercially sustainable and its benefits to extend beyond the narrow band of households around the asset threshold, it must be market-based. For insurance companies and their agents to be attracted into the market, they must have access to a significant clientele base. That the majority of livestock is held in the hands of a small, relatively better-off subset of the target population means that the product must be available to them. Secondly, the growing interest in micro insurance shows that the relatively poor could also demand insurance if the mechanisms for premium receipt and indemnity payments were adequately designed. The IBLI insurance will be sold on a per-tropical livestock unit (TLU) basis and made available to three categories of households in the ASAL region: HSNP-eligible households that have fallen well below the critical threshold, vulnerable households in the vicinity of the critical asset threshold, some

of whom may not be HSNP eligible, and better-off, HSNP-ineligible households that are above the critical threshold region. Including this last category of households creates a much bigger market for the provision of insurance and should contribute to the sustainability of the HSNP+ scheme by allowing private sector insurance providers to reach a profitable scale. Their premium payments can also enhance the liquidity of HSNP payments distributors, thereby benefiting HSNP performance.

Subsidization. Given the positive wealth and productivity effects expected from the provision of insurance to these types of households, and the fact that insurance should reduce the burden on the HSNP budget in future years, there is a strong case for subsidizing the IBLI premium for these types of households. This is especially true in the early years of the program where it is vital to have significant uptake of the insurance so that its impact can be analyzed. In order to explore the amount of subsidy actually needed to induce purchase of IBLI, individual households will be randomly allocated discount coupons ranging between 10% and 90% of the cost of the product. The cost of the subsidy schemes over the 5-year pilot phase is approximately \$200,000.

This figure is based on the following assumptions:

- All households in the PSN pilot areas would be offered the opportunity to purchase an amount of insurance equal to their livestock holdings registered in the baseline census to be carried out by the HSNP program
- 20% of households have no livestock of any sort
- 65% of households have modest livestock holdings that average five TLU
- 10% of households are in the vulnerable range and would be offered subsidies to cover up to 10 TLU (the critical threshold amount)
- 5% of households are well beyond the critical threshold and would be offered no subsidies
- 66% of households in all categories will purchase the insurance
- Those households that purchase insurance will purchase insurance for only 50% of the TLUs that they possess.

While subject to a certain amount of guess work, these figures are consistent with what we have learned from other index insurance schemes.

Launching the pilot. The HSNP program has the ambitious goal of initially targeting up to 70,000 households spread across the ASAL districts of Marsabit, Turkana, Msandera and Wajir. The PSN/HSNP+ pilot targets 84 communities in the Marsabit and Turkana districts, 42 of which are in six locations included in the HSNP treatment areas, and 42 of which lie in six HSNP “control locations” set aside for the HSNP evaluations. These 84 communities contain approximately 4000 households in total. The choice of the two districts was based on the availability of relatively high quality herd history that can be used to evaluate and price insurance contracts.

Implementation of the IBLI interacts importantly with the HSNP implementation in two ways. First, the HSNP program creates a census of all households in both HSNP treatment and control locations. These census data include the information on household wellbeing that permit the PSN component to appropriately target subsidies to certain households. The fact that this information is collected independently and in advance of the PSN program should ensure that the collected data are not distorted by the desire of households to qualify for IBLI subsidies.

Second, the HSNP program is implemented using electronic point of sale (POS) technology. There are approximately 150 POS locations spread across the four HSNP districts. The POS devices are programmed to permit the sale of insurance contracts. The PSN contracts will be written by a local Kenyan insurance company or consortium of companies, and underwritten by an international reinsurer. Individuals interested in IBLI will simply make their insurance premium copayments (“co-“ with whatever subsidy coupon they are randomly assigned) through their local payment point system. The POS devices can issue a receipt for the contract and verify the level of pre-qualified subsidy (and hence net insurance price) for each household.

Indemnity payments due to individuals could also be deposited into the HSNP accounts maintained for each individual. This ability to piggyback on to the HSNP financial mechanisms and databases will not only permit the implementation of a targeted subsidy scheme, it will also make the administration cost of the insurance quite modest and should enhance HSNP POS provider liquidity.

WHAT'S NEXT?

Rollout of the PSN IBLI product was shaped by two factors. First, the insurance can only be sold during a specified window (as individuals cannot be allowed to purchase the insurance after the random events that determine payoff are already partially or fully known). Possible windows for selling an annual insurance product are January-February (before the initiation of the long rains) or August-September (before the initiation of the short rains). The insurance covers losses in the 12 month period following the close of the purchase window. The product will be rolled out and sold in the latter half of 2009. Preceding rollout, we will make field visits to the sites to present the idea of index insurance and use the game to illustrate how insurance works. We also will work with the insurance companies to ensure that the sales are taking place on time.

A meeting in Kenya will be used to identify how we plan to roll out the insurance as a pilot in September 2009. We will also finalize the selection of sites to be monitored in the coming year and develop a plan for baseline survey work to be conducted. In the fall, a graduate student will join the project and provide support.

To show how insurance works, we will randomly invite 15 families from each of the 84 IBLI pilot communities to participate in the simulation games. To simplify logistics, the game will be offered in 42 places, with transport provided to bring participants from more distant communities to the game site. Insurance discount coupons (of randomly varying values) will be offered in the pilot communities.

In order to create the evidence base needed to accurately assess impact and allow mid-course changes to the HSNP program, as well as of the PSN component, we will carry out a carefully-reasoned, ethical impact evaluation of HSNP and HSNP+. There is almost no direct evidence as to whether or not, or by how much, a cash transfer or safety net program (individually or in combination) can improve welfare outcomes.

Both programs need to be evaluated in terms of their ability to reduce the ranks of the poor, increase their access to sustainable livelihoods, and make improvements in key welfare indicators. Such an evaluation requires that we observe households sorted into combinations of those receiving or not receiving HSNP and receiving or not receiving the PSN. We will track the following indicators over the four-year pilot:

- poverty gap measures
- livestock accumulation
- child education and health
- income and consumption

A set of 33 locations in the four ASAL districts are part of the evaluation. Between 66 and 76 households are slated to be interviewed in each location. Twenty-one of these locations will receive the HSNP treatment, and 12 will constitute control locations where HSNP payments will not be rolled out until phase two. We will interview sampled households at baseline, then one year later, and then at the end of phase one of the HSNP program. This will be important for the PSN evaluation as it will allow us to get information on insurance take-up and functioning.

Later years of the project will see a resurvey of households and an annual distribution of encouragement incentives to increase take-up of insurance.

ANTICIPATED OUTPUTS

- paper describing the game methods and outcomes, plus a presentation based on this paper that will be used in seminars and conferences
- paper that links game play to risk preferences
- monitoring and evaluation plan in place in Marsabit District and operational by the end of the fiscal year
- one or more co-authored BASIS briefs and one co-authored manuscript for journal review.

AREA BASED YIELD INSURANCE FOR PERUVIAN COASTAL AGRICULTURE

Principal Investigators

Stephen R. Boucher: University of California-Davis, USA

Michael R. Carter: University of Wisconsin, USA

Carolina Trivelli: Instituto de Estudios Peruanos, Peru

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

An area based yield insurance contract (ARBY) was designed and rolled out on a commercial basis to small scale cotton farmers in the Pisco Valley in Peru. The result of the collaborative efforts of BASIS researchers, private sector partners (the Peruvian insurance company, La Positiva; the Peruvian rural microfinance institution, Caja Rural Senior de Luren; and, the German reinsurance company, HannoverRe) and the Government of Peru (which provided funds to reduce the cost of the insurance to the farmer by 30%), the Pisco ARBY insurance pilot is one of only a handful of agricultural index insurance schemes that have been implemented anywhere in the developing world.

The potential benefits of ARBY insurance include greater willingness on the part of farmers to carry risk and engage in production strategies with higher returns, as well as a greater willingness on the part of financial institutions to lend to small-scale agriculture. The Pisco ARBY pilot includes an integrated research design to test whether or not these benefits occur. In addition, the project created a novel financial education game that has already been picked up by other groups implementing index insurance. Finally, the project's private sector partners have already learned from the pilot and are independently rolling out index insurance products for other regions of Peru for the 2009/2010.

Additional outputs

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_Conceptual.pdf

ACTIVITIES

There is a long history of direct government intervention in rural financial markets, and an equally long history of problematic and unsustainable programs. The basic reason for these policy failures is simple: the same constraints of risk and asymmetric information that inhibit the development of private financial markets also confront public efforts to substitute for private markets. As explained in Box 1, the costs of both government and market failure can be substantial. While recognition of the endogeneity of market failure warns against facile intervention, it also suggests a possible solution. In particular, were it possible to design a mechanism to independently insure and remove significant correlated risk from

the agricultural economy, then we could expect to cut the Gordian knot of agricultural financial markets by:

1. relaxing the direct supply side portfolio constraints created by correlated risk
2. undercutting the rationale for the destructive political economic cycle of disasters and financial rescues, further enhancing credit supply from the supply side
3. eliminating risk rationing and crowding-in credit demand if the insured covariant layer of risk is sufficiently important to smallholders
4. inducing technology adoption and more effective portfolio and savings strategies by individual farmers and rural households.

Box 1. Imperfect financial markets can make people poor



Peruvian coastal agriculture is a commercially-oriented, high potential area dominated by small holders who were beneficiaries of the 1970's land reform. In spite of their secure private property rights, privileged access to markets and infrastructure, and the presence of multiple commercial lenders many coastal farmers are constrained in their access to credit.

Type of credit constraint	A Freq. in sample	B Prod'ty change \$ ($\hat{\Delta}$)	C Relative change ($\frac{\hat{\Delta}}{\bar{Y}}$)	D Land controlled	E Impact on regional output
Quantity rationed	23.5%	516 (176)	58.2%	20.5%	11.9% (4.5)
Risk rationed	15.5%	478 (175)	68.2%	16.0%	10.9% (4.7)
Trans. cost rationed	10.5%	413 (216)	49.0%	7.8%	3.8% (2.1)
All constrained HHs	49.5%	482 (149)	58.9%	44.2%	26.0% (8.4)

Standard errors obtained by replicating the computation of each cell for 1000 bootstrapped samples

The table on the left, taken from a paper by Guirkinger and Boucher, suggests that financial market constraints may reduce production of coastal farmers by 26%. The high frequency of risk rationing, whereby farmers refrain from borrowing for fear of putting their land at risk as collateral, suggests that uninsured agro-climatic risk, in large part due to El Niño, is an important cause of these constraints.



In 2008, a pilot index insurance program in the valley of Pisco was launched. The insurance, called *Agropositiva*, was developed jointly with a Peruvian insurance company and is offered through a local bank. By offering cotton farmers protection against default in years in which average valley yields fall below 85% of the historic average, the insurance is intended to:

- *Crowd-in credit supply by reducing lenders' portfolio risk ;*
- *Crowd-in credit demand by reducing the risk associated with posting collateral;*
- *Promote farm investment and technology adoption.*

Unfortunately, conventional insurance contracts (in which indemnity payments are based on the losses experienced by an individual) are unlikely to be sustainable, nor provided by the market in smallholder agricultural sectors. Besides the simple transactions costs issue, moral hazard problems are severe as it is almost impossible for an insurer to monitor and control any negligent actions by the insured farmer over a cropping season that can increase the probability of crop failure and insurance payouts.

In contrast to conventional insurance contracts, payouts under an index contract are not based on individual outcomes. Instead, they are based on the outcome of an aggregate index that is correlated with individual outcomes. Because this correlation is likely to be imperfect, index insurance covers only a fraction of the risk the producer faces. The risk that is not covered by an index insurance contract is referred to as “basis risk.”

Using a data source that is promptly, reliably, and inexpensively available (and not manipulable by either the insurer or the insured), an index insurance contract makes the agreed indemnity payment to insured beneficiaries whenever the data source indicates that the index reaches the “strike point,” or insurance activation level. For example, consider the case of an area yield contract in which the index is determined by a reliable measure of average yields in an agricultural valley. If the long-term average yield is, say, 40 quintals of cotton per hectare, then the insurance might be activated at a strike point of 35 quintals (*i.e.*, when the average yield index falls below 87.5% of its long-term average). If the average yield index fell to 30 quintals, then individual farmers would receive a payment equal to the contractually stipulated value of 5 quintals per-hectare insured. Because it is not necessary to verify individual losses, transactions costs with index insurance are modest, a feature that is especially important if coverage is to be offered to small farmers.

While index insurance is thus promising, it faces a number of design and implementation challenges. The Pisco ARBY pilot has addressed two of those challenges over this year. The first is the design of an optimal, livelihood-focused insurance contract. The second is making insurance comprehensible to the never-before insured.

Designing livelihood-focused index insurance.

For a given cost, the goal of index insurance is to achieve the maximum reduction in correlated risk to farmers’ crop or livestock yields. While there are a multitude of metrics that can be used to define an insurance index (*e.g.*, millions of cubic meters of water entering an irrigation system), there are a number of advantages to expressing the index in the units of the income-generating activity that is being insured (say crop yields, or livestock mortality). Expressing the insurance index in livelihood metrics in no way limits the type of data used to generate the index—it simply requires the appropriate aggregator or transformation function to link cubic meters of water to crop yields. Putting the index in livelihood units in this fashion not only makes the insurance more comprehensible to the insured, it also makes it easier to establish and optimize the insurance index as a device to insure livelihoods.

Within this category of livelihood-focused index insurance (or insurance expressed in the metric of the insured activity), there are two broad types of indexes: Directly and indirectly measured. In each case, the index is an estimate of the average value of the farmers’ yields in the geographic coverage area defined by the policy. The difference lies in how the estimate is generated. As implied by its name, directly measured index insurance relies on direct measurements of farm yields to generate the estimate. Indirectly measured index insurance instead relies on measurement of the underlying sources of correlated risk (rainfall, temperature, etc.) to generate an (indirect) estimate of average yields. More esoteric measures, such as remotely sensed information on ground cover can also be used for this purpose.

For the Pisco ARBY cotton insurance, it was determined that indirectly measured yields would not be precise enough to yield a valuable insurance product for cotton farmers (see Carter *et al.*, forthcoming). We therefore moved to an index based on directly measured average cotton yields in the Pisco Valley. The average yield is estimated via a yield survey applied to a random sample of cotton farmers immediately after harvest. The final contract, which was determined in consultation with cotton producers association of Pisco and other actors is shown in Box 2.

Making index insurance comprehensible to the never-before-insured. No matter how well

designed, index insurance can only reduce risk, reduce distortions in farmer behavior and deepen agricultural financial markets if there is sustained and *informed* demand for the insurance. However effective demand for insurance may be weak among a population never before insured. Insurance is an intangible good that offers stochastic benefits: sometimes insurance delivers an indemnity payment and sometimes it does not. If farmers misunderstand or underestimate the value of the stochastic benefits of a well-designed insurance contract, then there will be little demand for the contract and little impact on farmer behavior. Conversely, if farmers overestimate the value of the insurance (especially index insurance, which offers only incomplete coverage of losses), then they are likely to be disappointed by the insurance and fail to continue to purchase it over time.

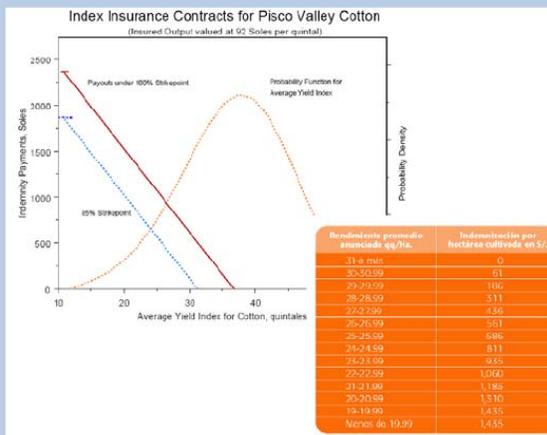
Without training potential buyers in financial literacy, it is unlikely that index insurance contracts will solve the problem of agricultural risk. Initially, many farmers who purchase it will be disillusioned if they don't receive payouts. Many will not purchase the insurance at all because its benefits are not obvious.

Recent efforts to implement index insurance have struggled with this problem. In India, a microfinance institution had to redesign and restart an index insurance program based on a rainfall contract after there was a massive cancellation of contracts by farmers disappointed by the lack of payments in a normal year. Clearly, these farmers did not fully understand the stochastic nature of the benefits provided by insurance. An innovative

project in Malawi also experienced very low uptake rates, likely due in part to farmers' inadequate understanding of the contract they were being offered. The importance of good financial literacy training is likely to be a key to successful agricultural insurance products.

Fortunately, the relatively new field of experimental economics offers tools that can be used to help individuals experientially learn and understand the workings of index insurance products. Economic experiments can be designed to

Box 2 The AgroPositiva Index Insurance Contract for Cotton Farmers in Pisco, Peru



The figure to the left shows the “AgroPositiva” index insurance contract for cotton producers that BASIS researchers are implementing in the Pisco Valley in Peru, in conjunction with the La Positiva Insurance Company, Hannover Reinsurance, and the MFI Caja Rural Señor de Luren. The contract is based on an average area yield index, with payouts made when average yields in the Pisco Valley fall below the specified strike point

The smooth curve shows the estimated probability distribution of the Pisco cotton yield index, while the lines show the payoffs received by farmers when the index falls to the indicated levels. This statistical information was used to price the product and create the discrete insurance payoff table contained in the orange box. While this payoff table, which is taken from the publicity flyer distributed to advertise AgroPositiva is somewhat more comprehensible for most people than the probability distribution, it does not fully communicate the benefits to the farmer when compared to an uninsured situation. As we discuss later in the proposal, educational efforts must be part of any index insurance program.

reliably elicit people's behavior in often complex circumstances that involve strategic considerations and uncertainty. These experiments employ real economic incentives as participants receive financial payments based on their performance and outcomes in the experimental setting. They also can exploit the ability to repeat games multiple times so that individuals can understand the complexities of the situation they face and learn the behavior that best suits them.

For index insurance, which offers a stochastic benefit that only appears from time to time, experimental economic methods offer the prospect of letting individuals play and replay their lives and farming decisions, with and without insurance, over a short period of time so that the benefits of the insurance can be understood and evaluated. We developed such a game for the Pisco ARBY project. Based on that experience, it seems especially important that such games be carefully framed to fit farmers' reality (and the terms of the actual insurance contract) as closely as possible in order to minimize the cognitive leap that individuals must make to transfer learning from the game back to the real decisions they must make. In addition, farmers, not surprisingly, appear to be closely attuned to the dynamic benefits of insurance—*i.e.*, its impact on their ability to sustain themselves and their productive capacity into the future. Insurance games must find a way to capture those benefits in a way that is simple, conforms to reality and can be implemented using the

rudimentary game devices available when playing games in field settings.

For the Pisco ARBY project, a game was devised in which a poker chip drawn randomly from a bag represented average yields for a group of players who formed a fictive valley. Each player then individually drew their own idiosyncratic shock by selecting a ball from a second sack. Individual yields and returns were then determined by both average yields and the idiosyncratic shock (with the latter representing uninsured basis risk). The probability of drawing different outcomes was carefully calibrated on the actual data about the correlated and basis risk faced by local farmers. Payoffs (in game currency) were in turn set to match actual prices, costs and returns for a typical small farmer. Players played long sequences of game years to learn about the probability structure and how insurance works. Box 3 illustrates the game.

Over the course of the summer, the game was played 24 times and a total of 410 producers

Box 3 Using Experimental Economics to Teach about Index Insurance

Chips by Type of Valley-Wide Average Yield		
Color of Chip	Type of Average Yield	Number of Chips
Black	Very Low (25 OQ)	1
Red	Low (30 OQ)	2
White	Normal (37 OQ)	4
Blue	High (43 OQ)	2
Green	Very High (48 OQ)	1

Individual Luck		
Color of Ball	Type of Individual Luck	Number of Balls
Purple	Bad	1
White	Normal	2
Yellow	Good	1

PROJECT A: COTTON WITH LOAN			
Very Low (25 OQ)		Low (30 OQ)	Valley-Wide Average Normal (37 OQ)
Luck	0 (Debt)	250	0 (Debt)
	0 (Debt)	600	0 (Debt)
	0 (Debt)	900	0 (Debt)



Poker chips and multi-colored ping pong balls were used to help farmers experientially learn how index insurance operates, including the critical concept of uncovered or basis risk. The charts to the left show the distribution of the poker chips and ping pong balls in the sacks from which farmers drew to determine their

outcomes. The poker chip distribution is a discrete representation of the probability function shown in Box 3 above. The basis risk ping pong ball distribution was derived from econometric estimates of the severity of idiosyncratic risk in the region.

The payoff table above shows how the two risk components blend together to generate financial outcomes for farmers. As shown in the photograph, farmers were grouped in 'valleys' and played multiple years of the game with and without insurance. The session photographed here included local farmers as well as the head of the Pisco branch of the MFI Señor de Luren and the head of the new index insurance division of the La Positiva insurance company.

FUNCIÓNARÁ A TRAVÉS DE CAJA RURAL SEÑOR DE LUREN DE ICA

El primer seguro agrario tendrá un costo de S/.146

■ Gobierno dice que pronto saldrán otros seguros gracias a un fondo de cobertura

MARIANELLA ORTIZ

Si durante la década de los 90 hubiera existido un seguro agrario, los algodoneros habrían recibido, al menos en seis campañas agrícolas, una indemnización por problemas de baja productividad. Este ejercicio mental fue realizado ayer por los funcionarios de la compañía La Positiva Seguros y Reaseguros, que lanzaron al mercado su producto Agropositiva, para los algodoneros de Pisco.

Este seguro agrario, que funcionará a través de la Caja Rural de Ahorro y Crédito (CRAC) Señor de Luren, es el primero de su tipo en la historia agrícola peruana. El producto cubre a los algodoneros para los casos en que la productividad del valle pisquero baje a niveles menores a los 31 quintales por hectárea, por factores como el clima u otros imprevistos. Tal como ocurrirán seis oportunidades en la década de los 90.

La prima por el seguro será de S/.146 por hectárea al mes.

Según el gerente general de la compañía, Guillermo Zarak, se asegurará en esta primera etapa a por lo menos 850 algodoneros. Refirió que a partir del 2009 tra-



PRIMEROS. Los algodoneros se cubrirán de posibles pérdidas gracias a un seguro diseñado para ellos.

EL DATO

Indemnización

La indemnización es gradual. Si se determina que la productividad en esta campaña fue de entre 30 y 30,99 quintales por hectárea se indemnizará con S/61 por cada hectárea asegurada. Otro ejemplo: si cae entre 23 y 23,99 se entregará S/935. Si llega a estar por debajo de 19 quintales será S/.1.435.

bajarán para ofrecer este seguro para otros productos agrícolas.

El gerente corporativo técnico de La Positiva, Gustavo Cerdeña, resaltó que se pudo fijar la póliza en S/.146 gracias al fondo creado recientemente por el Estado, de S/.40 millones, para este tipo de seguros. De lo contrario—añadió—el valor real sería de aproximadamente S/.200.

Resaltó que uno de los efectos positivos de contar con un seguro para un sector con alta siniestralidad como el agrario es que

los agricultores podrán acceder a mejores tasas de interés.

Por lo pronto, la gerencia de la CRAC Señor de Luren aprobó reducir en 0,25% la tasa de interés mensual a los agricultores que accedan a préstamos y se acojan a la prima. Actualmente, la tasa del crédito está entre 2,5% y 3%.

Los niveles de rendimiento fueron el resultado de un estudio realizado por el programa Basis-AMA de la Universidad de Wisconsin con la colaboración del Instituto de Estudios Peruanos

(IEP). Para ello fue vital contar con las estadísticas de productividad de, por lo menos, 15 años. La indemnización puede llegar a ser de S/.1.435 por hectárea si la productividad cae por debajo de 19 quintales, como ocurrió con el fenómeno de El Niño de 1997.

En los meses de julio de cada año, al final de cada campaña agrícola, se determinará el promedio de rendimiento del valle.

FONDO DEL ESTADO

El Gobierno espera que este sea el primero de otros seguros más que lanzará en las próximas semanas el sector privado. Para ello, el Ministerio de Agricultura publicará para fines de este mes el reglamento de la norma que creó el Fondo de Apoyo al Seguro Agropecuario, el cual asciende a S/.40 millones.

El presidente del Consejo Directivo del Fondo del Campo y del Seguro Agropecuario del Minag, Javier Montero, detalló que con este fondo se cubrirá en una primera etapa 388.000 hectáreas.

El principal interés del Gobierno es que gran parte del fondo se destine al tipo de seguro que han denominado catastrófico. Este no registrará, como el producto lanzado por La Positiva, en función de los índices de rendimiento del cultivo, sino por los efectos de problemas climáticos u otros fenómenos naturales.

Montero refirió que en esos casos el seguro podría cubrir hasta el 100% de la póliza.

El objetivo es que el seguro para catástrofes sea dirigido a los pequeños productores del país que no podrían pagar incluso los S/.146 de Agropositiva. Al respecto, La Positiva dijo que en el futuro también podrá ofrecer este tipo de cobertura.

DEL CONSULTOR

EDUARDO ZEGARRA
Economista



Solo debe ser para pequeños

El lanzamiento del seguro agrario es una buena noticia. El modelo adoptado por el Minag es parecido al de México, que tiene una amplia cobertura y otorga fuertes subsidios. Los contratos de seguro diseñados por el Minag son mayormente individuales y de formato tradicional, requieren un seguimiento constante y por eso son muy costosos, especialmente para pequeños agricultores dispersos.

Un aspecto de la iniciativa, sin embargo, es haber creado un tipo de seguro agrícola llamado catastrófico. En esta opción los agricultores podrán agruparse y asegurar sus cultivos en forma colectiva, tomando en consideración los rendimientos promedio de su zona. Esta opción es altamente favorable para los pequeños productores (que son el 80% en el país) y es el tipo de esquema que La Positiva, con apoyo del IEP y la Universidad de Wisconsin, está lanzando como programa piloto en el valle de Pisco. Lo que falta aclarar por parte del Minag es cómo va a funcionar el subsidio en el esquema general del seguro. Lo deseable es que solo se subsidie a los pequeños productores, como los que tenemos en Pisco.

participated. The game was designed to help farmers understand how the insurance works, the circumstances under which they would and would not receive payout, the structure of payments, and the insurance costs. The game was played with a selection of farmers in order to have a control group of people who were offered the insurance but had not participated in the game. Information gathered at the game and in surveys afterwards were used to help in product design and gauge understanding.

Insurance products offered for sale. Following the game and extensive work with La Positiva Seguros y Reaseguros, our private sector partner, a product called Agripositiva was offered for sale to cotton farmers in the Pisco valley. The product was formally launched in July at a press conference in Lima (see Box 4). It was primarily marketed offered to those producers who were seeking loans

from the Caja Rural Señor de Luren, but non-borrowers could also purchase the insurance as a standalone product. For borrowers, the Caja offered a substantial interest rate reduction to reflect the reduced risk on loans to insured farmers. A video was developed to help farmers understand the product, using similar financial literacy training as was used in the games. While take-up rates were somewhat lower than anticipated, a number of basic marketing errors were made and appropriate corrections are being undertaken for the 2009/2010 crop year.

In 2007, the Peruvian Congress approved a \$30,000,000 fund for the purpose of promoting agricultural insurance for small farmers. BASIS researchers and our private sector partners interacted with the government and eventually secured an agreement for a 30% cost-share on the

final price of the insurance. This agreement has been renewed for the 2009/10 agricultural cycle.

In addition, the insurance company La Positiva is currently working on offering related products in other areas. They are looking both at selling in other cotton producing areas (the Chincha valley), as well as expanding to other crops such as maize. The research done by the AMA CRSP helped make the development and offer of this product a reality. The goal now is that the private sector will continue to scale up the availability of agricultural insurance in Peru, improving both productivity and farmer wellbeing.

Cotton yield survey in the Pisco Valley. Given the importance of accurate yield information to this type of insurance product, researchers carried out surveys on yield to test our yield measures. The survey gathered data will allow researchers to adjust yield measures in order to make them comparable with the official data from the Ministry of Agriculture on which the strike point is based. These surveys included the collection of data on the harvested area, the total cotton production and the location and geographical information of each cotton plot in the sample. In addition to the yield survey, several interviews and analyses were carried out in order to obtain complete understanding of the official data's methodology.

After analyzing the collected data on cotton yields in Pisco, several challenges needed to be addressed in order to be able to compare our measures with the official data. Our estimates were significantly higher than the Agricultural Ministry's estimations. Researchers also obtained reliable information showing that the declared size of the plot was not accurate; in order to have accurate yields we had to include in the survey plot size measures. In order to prevent any future problem with the survey results and to help any evaluation or monitoring, once the survey sample was selected (including possible replacements for cases that could not be interviewed) we place a copy of it in a closed envelope in a Public Notary for them to keep it until the process has finished and the average yield is announced in July 2009.

To minimize the problems the yield survey was divided into two parts: one to have the planted areas in our cotton plots, which includes a reliable

measurement of each plot in the sample; and a second visit to the same plots in June to obtain information on the cotton production. A new sample of 604 cotton plots was drawn to establish a measure of cotton yields for the first year of the insurance. Data obtained from the 2008 survey have been utilized in the updating of the contract for the 2009/10 agricultural year.

Research strategy. The point of the Pisco ARBY pilot is not just to implement an insurance contract, but also to see if insurance has its desired effects on producer households and local financial markets. To this end, a household impact survey was designed and conducted. The sample of interviewees was randomly selected from the cotton producers data base available for Pisco (Plan de Cultivo y Riesgo 2007/2008). The universe consists of more than 3000 producers and a random sample of 800 households was selected as well. The sample considered three different groups prior to the selection process: (i) those who received invitations for the games, (ii) the producers who received discount coupons, and (iii) those with neither. A baseline survey was conducted prior to the initiation of the 2008/2009 crop year. The survey will be conducted in subsequent years to see the effects of the insurance on farm productivity and rationing status in credit markets.

Given our expectations of offering an insurance product able to have an impact on the credit supply for the insured crop, we are working on defining a baseline of credit amounts for agriculture in Pisco, mainly for cotton, as well as in the conditions that such credit supply should imply. Researchers are working closely with the credit analysts of CRAC Sr. de Luren in Pisco to identify credit allocation, and the credit evaluation and approval process at the beginning of the cotton production season. Researchers are also working to create a detailed database of the agricultural credit transactions prepared by CRAC Sr. de Luren. Once solid baseline data is available, follow up surveys will help determine whether or not the provision of agricultural insurance has increased lending for agriculture.

AMA RESEARCH THEME: SMALLHOLDER ACCESS TO MARKETS

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 smallfarmers 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

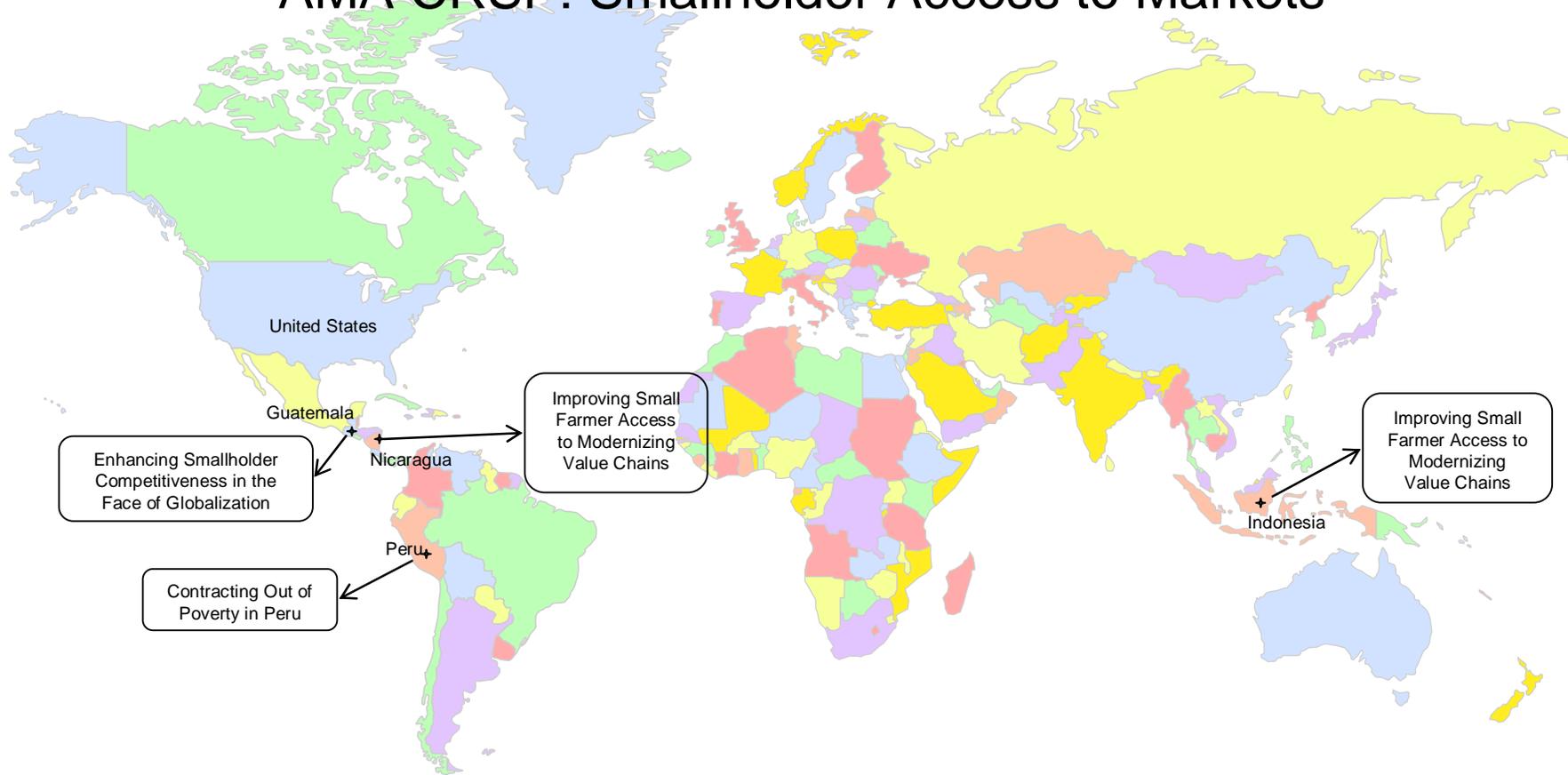
- Access to Modernizing Value Chains by Smallfarmers in Indonesia and Nicaragua
- Contracting Out of Poverty in Peru: Experimental Approaches
- Enhancing Smallholder Competitiveness in the Face of Globalization

AMA BASIS BRIEFS

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. July 2007.

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

AMA CRSP: Smallholder Access to Markets



ACCESS TO MODERNIZING VALUE CHAINS BY SMALLFARMERS IN INDONESIA AND NICARAGUA

Principal Investigators

Ronnie S. Ntawidjaja, Padjadjaran University, Indonesia

Francisco J. Perez, Central American University, Nicaragua

Thomas Reardon, Michigan State University, USA

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

THE AGRIFOOD ECONOMIES OF DEVELOPING COUNTRIES are undergoing a deep restructuring, with a rapid diffusion of supermarkets, fast food chains, modernized wholesalers, and large-scale processors. With globalization and rising competition, the food industry is moving away from reliance on the spot markets and brokers that dominated traditional product value chains. Emerging evidence suggests that the rapidly developing restructuring in the food industry tends to exclude many smallfarmers, especially those with poor asset portfolios. For example, research examining tomato growers operating in the transforming markets in Indonesia and Nicaragua shows that, unassisted, asset-poor smallfarmers are excluded from modern channels, the governance of which is dominated by specialized/ dedicated wholesalers and supermarkets. Only smallholders with an adequate asset base are able to participate.

This project examines the asset-related determinants and impacts of the participation of smallfarmers and farmer organizations in modern versus traditional market channels in Indonesia and Nicaragua. The research identifies the specific extent, nature and determinants of the restructuring of the product value chains. We examine the determinants of inclusion or exclusion of smallfarmers in the restructured market channels, and gauge the asset and income effects of this participation.

Additional outputs

“Informe Preliminar del Estudio del Análisis de Estructura de Gobernación en Grupos Asociados de Productores de Las Cadenas de Valor de Plátano y Fríjol en Nicaragua.” February 2008. Preliminary report.

ACTIVITIES

Indonesia

We were invited by the Directorate General of Horticulture, Ministry of Agriculture to participate in an workshop on mango and mangosteen.

Participants included main export companies, research institutes, government agencies, donors, and NGOs. The agenda covered policy, market, and production issues. We presented the AMA project and held policy dialogues with the Ministry on the design of the study and policy issues.

We met with a representative of AMARTA Project (USAID). We will provide them with outputs of our project. We also met with USAID/Jakarta to brief that office on our AMA project.

We had extensive meetings with the team at the Center for Agricultural Policy and Agribusiness Studies (CAPAS), Padjadjaran University in West Java, Indonesia. We interviewed candidates for the masters program at Michigan State University as part of the AMA project, and conducted a literature review and initial interviews with several key informants in the mango sector in Bandung.

We held intensive workshop sessions with the CAPAS team and other research staff and faculty to discuss in detail the methodology of value chain (VC) studies used in this project. To date there is no handbook or reference for the particular kind of VC studies that we are doing. Such a handbook will be produced by the project as an important teaching and capacity building aide.

The CAPAS team undertook a rapid reconnaissance trip in East and West Java to identify study zones, and carry out pre-key-informant interviews. Then we drafted the “inception report,” which details the plan for the key informant interviews with farmer groups, wholesalers, brokers, logistic agents, processors, and retailers. The report contains will help us better orient the key informant interviews while serving as a solid base of hypotheses that we can test in the fieldwork. The team also identified wholesale markets dealing in the study products in order to begin to form the sample frame for the wholesaler medium-sample surveys.

In East Java, four districts (*kabupaten*) and the consumption areas of Surabaya and Jakarta were selected for the study of both mangoes and

mangosteens. We visited the Malang region to examine its processing industry. In West Java, since the mango and mangosteen areas are separate, two *kabupatens*, Tasikmalaya and Purwakarta, were selected for mangosteen and three—Cirebon, Majalengka, and Indramayu—were selected for mango.

A reconnaissance trip generated the inventory of informants and a basic mapping of the chains. We drafted a detailed interview guide for each type of key informant and began interviews. We drafted a wholesaler-survey planning document that will guide questionnaire formation, locations, and exact plan for operation. We undertook surveys with a sample of 30-40 wholesalers per wholesale market, per crop.

Nicaragua

We conducted interviews with key NGO, industry and government informants to determine critical individuals and institutions in Nicaragua’s supermarket value chains. We then conducted interviews and site visits that allowed the mapping of ways in which smallfarmers participate in market relationships with supermarkets.

We established a list of communities where the primary supermarket retailers directly procure fresh fruits, vegetables, beans, roots and tubers. The domestic supermarket chain readily supplied this information, while Wal-Mart proved more challenging. We located names of former buyers for Wal-Mart, who provided lists of municipalities that supplied the supermarket chains and descriptions of price setting and contracting strategies.

We mapped producers selling indirectly to supermarkets through networks of intermediary wholesalers. Wal-Mart has largely moved to direct purchasing from farmers but the domestic supermarket retailer maintains a highly disaggregated procurement system with an indirect participant population that may be quite large. Through store visits and manager interviews we assembled a list of intermediary wholesalers.

We gathered existing background production and price data. We worked with the Nicaraguan government to access and understand the

methodology behind their existing data on semi-weekly prices in Nicaragua's regional wholesale, traditional consumer and supermarkets. This work included trips with government statisticians to the Managua markets to collect price data. Government price data for Managua is reputable and useful.

We established new price data sources. We collaborated with NGOs and producer groups to digitize paper records on prices producers have received from supermarkets over time and the amounts they have sold. We collected consumer prices once a week for a range of products in the two Wal-Mart supermarket chains not followed by the government statistical agency. An NGO-assisted producer cooperative proved an excellent source for data on prices and quantities sold to supermarkets.

We studied a Wisconsin panel dataset to determine overlap with Nicaraguan supermarket suppliers. Within the known procurement areas surveyed, we found that 1.8% of surveyed producers had sold to supermarkets. Of the 438 households that we located and interviewed in communities known to have supplied supermarkets or with a high likelihood of supplying producers, we located eight producers who have supplied supermarkets with fruits and vegetables since 2003. Within this set of producers, there was considerable variation in duration of the relationship as a supplier and the product supplied: a producer that sold pineapple twice in 2005; a producer with an ongoing relationship supplying tomatoes to a supermarket since 2006; a producer who sold jalapeño to a supermarket chain through an NGO intermediary. The results suggested that the panel would not sufficiently overlap with the set of Nicaraguan producers in supermarket supply channels.

We conducted a census of current and former supermarket producers in Nicaragua. Teams began in communities known to have supplied supermarkets. Enumerators assembled lists of all farmers who ever had relationships with supermarkets and sought the names of other communities where supermarkets had purchased. Nearly 750 Nicaraguan producers have sold vegetables, fruit, or basic grains to domestic supermarkets.

We identified the SFOs to be analyzed and interviewed exporters, specialized wholesalers, and supermarkets procurement officers to identify

which SFOs supplied the modern channels in both plantain and dry bean sectors. We interviewed other key agents of the value chains, such as NGOs, second floor cooperatives, university researchers, and government entities to identify the type and location of SFOs *not* participating in the modern market sector.

We surveyed 25 dry bean and seven plantain SFOs and collected the following information; (1) the dynamics of marketing relations between the SFOs and agents upstream, downstream and across the value chains, (2) why and how SFOs define their marketing channels, and (3) the price negotiation power of the SFOs and whether they have a differentiated product in the market.

We interviewed key informants from (1) production sector in order to identify changes in agricultural production or new varieties, (2) NGOs and international programs in order to understand the role of subsidies and dynamic market access, (3) and supermarkets and hotels in order to identify the relationship between quality standard and procurement system

FINDINGS

Participants in supermarket supply chains include (a) smallfarmers accessing domestic supermarkets, with NGOs facilitating credit, negotiation and technology services, (b) independent producers selling to supermarkets *without* assistance from NGOs, and (c) smallfarmers selling indirectly to supermarkets through intermediary wholesalers. Many wholesalers reported that they purchase at regional markets or rely on a small number of producers to fill orders for seasonal products.

Wholesalers were extremely reluctant to supply information about their sourcing strategies. Given that the bulk of sourcing by these wholesalers is through large Managua markets, it is likely that smallfarmers selling to supermarkets through these intermediaries are unaware of the destination of their production, and therefore do not alter their production or post-harvest systems nor receive a higher price.

We were able to classify SFOs by type and origin and how they have evolved as organizations and were adapting to new market conditions.

WHAT'S NEXT?

The first goal is to determine the nature of the restructuring of the product value chains and what factors drive the changes. We hope to learn the extent to which restructuring is driven by export or domestic retail transformation, and how government policies condition that restructuring.

The second goal is to detail factors that determine inclusion or exclusion of smallfarmers in the restructured market channels. We will look at the roles played by the range of assets a smallfarmer holds, both as to type of asset and as to thresholds needed to be a part of the restructured value chains. We will pay especial attention to how SFOs condition that participation, and how policy and development programs can best improve participation.

The third goal is to detail the asset and income effects of market participation in modern versus traditional channels. We will test the extent to which a smallfarmer's assets, local institutions, and government policy determine inclusion in the markets. We also will be able to show the extent to which participation in modern channels provides net benefits and lower risk than traditional channels. We will form recommendations that bolster context- and country-specific policies intended to help smallfarmers build assets and improve their access to modern channels.

In Nicaragua, we added three products to our value chain analysis and farm household studies: tomatoes, lettuce, and bell pepper. Plantains were the only product in the original plan. Including the other products allows us to study and compare differentiation over market segments, perishability, technologies and rungs of the value ladder linked to stages of the product cycle. We can undertake a panel data analysis on tomato households using the sample from a survey of tomato households in supermarket and traditional channels. In Indonesia, we will implement complete the farm and village survey in the study zones (1000 farm households and approximately 40 villages).

In both countries, we will undertake the product-specific value chain (VC) analysis. In Indonesia, the products are mango and mangosteen; in Nicaragua we shifted to a spectrum of products representing progressive points on the “value

ladder,” the rungs of which are increasing levels of profitability. We differentiate the channels:

- “modern-private,” with the downstream prime movers being multinational companies and medium-large domestic companies
- “intermediate-cooperative”
- “traditional,” with the downstream prime movers being small-scale informal processors, retailers, and traders.

In the coming year, we hope to supply details on:

- determinants and impacts of smallfarmers participating in the VCs, especially the private-modern and the intermediate-cooperative type, which are hypothesized to provide more income than the traditional VC but have greater entry requirements. What determines whether small, poor farmers and women are included? Are smallfarmers competitive with larger farmers once included? What are the net gains for smallfarmers from participation?
- constraints to scaling-up. Can inclusion and competitiveness be sustained over time, and can scaled-up versions of the VCs and the accompanying interventions also be sustained? Can a private-modern VC profitably include smallfarmers? Can they profitably continue to include smallfarmers when the VC expands into areas where smallfarmers have less access to infrastructure? What specific investments would be needed to allow it to do so?

Several types of interventions can be studied: “institutional,” “infrastructural,” “technological,” and “policy.” For plantains in Nicaragua and mangoes in Indonesia, our work will inform debates about interventions to support smallfarmer organizations, agroindustrial clusters, supply chain/subsector upgrading programs, credit programs, contract design, processing technology, extension, and irrigation programs. Similar topics are germane for tomatoes and lettuce. We will dig into exactly what interventions are being carried out, and how they affect the structure and conduct of the VC. After the farm surveys, we will know more about how those interventions perform and should be modified.

CONTRACTING OUT OF POVERTY IN PERU: EXPERIMENTAL APPROACHES

Principal Investigators

Marco Castillo, Georgia Institute of Technology, USA

Javier Escobal, Grupo de Análisis para el Desarrollo, Peru

Ragan Petrie, Georgia State University, USA

Maximo Torero, International Food Policy Research Institute

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

POOR, RURAL FARMERS ARE OFTEN LEFT OUT OF THE MARKET when they cannot compete with larger farmers who provide exporters a consistently high-quality product. While some of these problems stem from scale, the smallfarmers' inability to commit to a contract is also problematic.

The project tests contract designs in the field to measure improvements in farmer welfare based on his or her participation in different types of contracts. The research aims to help in the design of new institutional mechanisms that favor the inclusion of smallholders and link them to dynamic markets through efficient contract farming arrangements. By refining these mechanisms, the project will help integrate smallfarmers 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 expect the project will have a direct effect on poverty because of improved and higher quality productivity. This will reduce marketing margins, increase farm-gate prices, and boost the incomes of rural households. At the same time, the companies that take the farm products will have greater access to better quality supply and can significantly reduce their monitoring costs.

Key indicators

- improvement of farmer welfare
- increase in the number of contracts a company has with smallholders
- change in farmer production and income under different contract structures
- number of farmers producing mango, especially high-quality Kent mango
- number of policymakers and high-level host-country stakeholders involved in project policy workshops and formal meetings

ACTIVITIES

Three firms in northern Peru—Sunshine, Cepicafe and Repeban—expressed interest in working with us on contract design. These firms represent very different market structures. Sunshine exports mangoes and has individual contracts with producers. It buys mangos from the producers, then processes and sells them for export. Cepicafe is a cooperative that buys coffee from cooperative members. It has contracts with member farmers and buys raw coffee beans and processes them for export. Repeban is a cooperative that offers packaging services to banana farmers. Individual farmers have a contract to sell their bananas to Repeban, which packages the bananas and sells them to an export firm.

Because Sunshine has standard contracting arrangements, where a firm contracts directly with a producer, we decided to work with Sunshine on implementing contract designs the first year. We maintain contacts with Cepicafe and Repeban, and later in the project plan to move to contract design structures with firms with different characteristics, for example joint liability production contracts.

Surveys. We completed the baseline survey with roughly 400 farmers in Piura and Motupe, in northern Peru. These farmers contracted with Sunshine in the 2007-2008 season and expect to contract with Sunshine in the 2008-2009 season. In the household level survey, the husband and wife were interviewed separately by male and female enumerators, respectively. The survey includes questions on agricultural production, detailed production data on mangos, demographics, and GPS location of the household and each production plot. The GPS data allow us to overlay accessibility maps on household location to control for transportation costs in production.

We also conducted risk experiments with the husband and wife. This gives us a behavioral measure on risk that we can use to understand agricultural decisions and the response to the randomized contract the producer in the household was offered.

Our survey has an innovative technique to include differences in gender in reporting information. Specifically, we developed surveys that have a questionnaire to be answered 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 and female) and concluded there was 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 as the household member.

Pilot contracts. Sunshine worked with us on implementing pilot contracts in the field with its producers. Based on a confidentiality agreement, Sunshine gave us three years of production and price data from each contracted producer. These data include the name of the producer, the quantity and quality of mangos sold to Sunshine, prices paid to producers, and contract specifics offered to each producer each year.

Sunshine agreed to collect information on input use and mango production decisions on a monthly basis through the pre-harvest period (September-March). These data are important because they will tell us how each producer responded to the contract he/she was given.

We piloted two contract components: a price incentive for increased production of first-quality mango, and credit for input purchase tied to the firm at the local credit union. Some form of contract (no price incentive and no credit, price incentive only, credit only, and price incentive and credit) was randomly offered to the 400 farmers in our baseline survey.

The contracts are currently in force. A follow up survey will reveal how production and input use changed over the season depending on the contract that was offered.

Challenges. The following factors may result in the randomization protocol not being completely followed and the incentives in the contract not working as we expected, since they were calibrated for a normal production year.

A regional retraction of credit in northern Peru put pressure on Sunshine since the credit union has not allocated credit as promised. The company told us that it was going to give loans directly to the producers to be able to cover the number of producers they needed to meet promised supply. As a result, we believe there is a possibility that our

random assignment of contracts has not been followed completely as agreed.

The input price of organic fertilizers has significantly increased because of a surge in the price of oil in the first six months of 2008. This could have significant effects on productivity for any agricultural project implemented in 2008.

Climate changes could affect productivity levels this season. Initial reports from our field team indicate that productivity could be reduced by around 40% this year because the temperature is about three degrees above normal.

We addressed these challenges by trying to mitigate the effect of the credit crisis on our experimental design. We have very good information on producer observables and unobservables that helped us identify the impact of

contracts, even if our protocol is not followed. That is, not all households or the additional households to the ones randomly selected under our protocol were also selected by the company to receive the credit. We also went back to the field to identify if the experimental protocols were followed and uncover any other potential biases as a result of the credit crunch and changes to productivity.

Training. We implemented a two-week training course on our new survey design (gender specialized), a three-day technical training workshop on mango production, for which we brought in specialized engineers on mango production from Sunshine. We also held a one-week training workshop on our risk aversion experiment protocols and designs.

WHAT'S NEXT?

Design and implement new contracts. We will conduct experiments with the same set of farmers in the baseline survey to help us design new contracts for the next agricultural season. We would like to better understand the trade-offs that farmers face when choosing between contracts that require more time and cash-in-advance in exchange for higher prices. We will conduct experiments to better understand impatience, or the willingness of farmers to give up a smaller payoff now for a higher payoff in the future.

Using the intervention of the new competitor company in the region, we can see if those who chose to break their contract and sell to the competitor are more impatient than those who did not. These experiments will measure the elasticity of labor supply and will give us a better idea of how to set price incentives in contracts to change behavior. We suspect that the timing of potentially realized profits will be crucial to the success of contracts.

We will implement new contracts, including linked markets (individual tied-product contract) and linked contracts (group contracts). Sunshine has agreed to implement these in the 2009-2010 season. For the group contracts, a well-established mango producer in the area has agreed to help us implement these, since they require coordination across producers.

Before we design new contracts, we will conduct experiments with the producers to get a behavioral measure of each producer's elasticity of substitution between labor and leisure, and experiments that give us a behavioral measure on trust.

A follow-up survey after the current mango season will give us measures of production and profit that will help us assess the impact of the various contract structures. The survey will concentrate on mango production, input use, and credit use.

We will link with the Inter American Development Bank (IADB) to work on scaling up what we are learning from our field contract experiments to other product markets and countries. IFPRI had been working with the Multilateral Investment Fund (MIF) of the 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 initially being established for Guatemala and Nicaragua. The MIF has approached IFPRI to help establish this facility in Peru. This opens a significant opportunity to use what we are learning from our BASIS funded project to include in the criteria of the competitive grant process. We will also explore with them if we can include our contract designs. MIF will also allow us to evaluate these interventions.

Data analysis will tell us what type of farmers select into the various contracts we designed and how well the contracts worked. With this information, we will conduct pilot experiments in order to design new contracts, which Sunshine will randomly offer to farmers.

We also will identify additional companies and products with which we can implement new contract designs. Specifically, for our contract trading market design, it would be ideal if we could find a market where, in addition to multiple farmers, we have multiple companies. Organic bananas seem to be an optimal case. The government supports plans to introduce organic bananas in the same areas where we are working with mango farmers.

Data collection and analysis. We will collect data in August-September 2009 as a final follow up to the baseline survey and as a new baseline for our interventions. We will ask detailed questions about production, including quantity produced, prices, contracts and input use. We will focus on the welfare modules of our baseline survey to be able to measure the impact of the interventions implemented in 2008. Sunshine gave us data on its purchased production and purchase prices for the prior three growing seasons. We will collect the same data from the firm for the past year's growing season. We will use this to cross-check with data collected from farmers, allowing us to better understand the incentives behind the firm's behavior.

In analyzing the data, we first will examine the determinants of selection into the contracts that were offered. For example, can a farmer's choice to accept the contract be explained by prior production, risk aversion, or household characteristics? Second, we will examine the effect of the contract structure on farmer profit and input use. Finally, we will examine what determines what contracts the firm offers. We will also analyze the impact of our interventions.

Evaluation of shocks. Based on the data collected from surveys and from interviews, we will carefully evaluate the different problems that the farmers and the company faced during the 2008-2009 growing season.

Weather risk. The cold weather essential for the mango trees to blossom came late this past season. Preliminary estimates show that there was a 10-20% reduction in production relative to the previous year. This significantly impacts the contract design based on productivity incentives for increases in production of top-quality Kent mango. We will evaluate if this affected both areas of intervention (Motupe and Tambogrande) and all individual farmers.

International price increase of inputs. This significantly impacted organic fertilizers. In the survey implemented near the end of the growing season, we collected detailed information on monthly use of inputs. We will use these data to evaluate the international price shock on productivity.

Intervention of a new company in the area. A competitor company, new to the area, aggressively purchased mangos from the farmers this past growing season. This created a new incentive for farmers to defect from contracts with Sunshine and

sell their production to the new company, which offered higher prices because it had not spent any money buying inputs for farmers or making loans. We will evaluate the effects of this intervention.

Training and outreach. We will use IFPRI's Mobile Experimental Economics Lab in the implementation of our new contract designs. Also, we will hold one seminar with the help of our partner GRADE. In the first session, all the findings of our research will be explained. In the second session, we will invite different companies and leaders of farmer groups to discuss the results. We will establish a network of agri-business stakeholders for sharing lessons to replicate successful models of vertical coordination in the high-value food sector. We will prepare a road map for promoting these types of institutional designs. A close interaction with stakeholders through workshops and advisory councils will guide the entire research process to ensure its relevance.

ANTICIPATED OUTPUTS

Preliminary results will be included in papers and presentations. One paper will evaluate the impact of problems faced in our contract designs. A second paper will detail the determinants of contract selection including our experimental measures of risk aversion. A third paper will look at the effect of various contract structures on farmer productivity and profit. A fourth paper will focus on selection effects into contracts taken and offered in a bilateral bargaining environment.

In addition, the experiments will yield a paper that uses the experimental measures on risk and correlates them with production, and a paper on results from the labor-leisure experiments and the design of the contract market.

ENHANCING SMALLHOLDER COMPETITIVENESS IN THE FACE OF GLOBALIZATION (GUATEMALA)

Principal Investigators

Alain de Janvry, University of California-Berkeley

Craig McIntosh, University of California-San Diego

Tomas Rosada, Universidad Rafael Landivar, Guatemala

Elisabeth Sadoulet, University of California-Berkeley

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

SMALLHOLDER FARMING HAS BEEN THE INSTITUTIONAL STRUCTURE for some of agriculture's most effective historical contributions to economic development. The market institutions that underlie smallholder farming are critical in many ways, including national development, poverty, and the global food crisis. This project seeks to understand several mechanisms that promise to assist rural populations: Fair Trade certification, second-tier cooperative organizations, and innovations in microfinance, such as credit bureaus and commitment savings products.

To examine institutions that assist smallfarmers directly, we analyze Guatemala's coffee markets, exploring the nature of the contracts in several related ways. First, we use rich sources of institutional data to analyze quality, price, and Fair Trade premia in the largest second-tier cooperative in Guatemala. Second, we conduct a detailed field survey of coffee producing cooperatives in the country, and intersect 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. Fair trade demand will also be analyzed in terms of consumer demand in the United States.

We also look for ways to expand access to formal financial services among rural populations. We draw on new theoretical insights to highlight two products of particular promise. The first of these is the provision of commitment savings products through microfinance institutions. Given a new literature on the role of illiquidity and commitment problems inhibiting agricultural productivity, the provision of formal commitment savings to such populations may provide an unexpected avenue for welfare improvements. The second institution we examine is the credit bureau, which, through fortifying the health of lending portfolios and preventing over-indebtedness, can foster the expansion of credit to new segments of the market.

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

Additional outputs

Ozier, Owen. 2008. "The structure of Fair Trade Coffee Production in Guatemala and Price Transmission to Farmers."

Sanborn, Rebecca. "Fairtrade Coffee Production in Guatemala." Report produced for the University of California, San Diego.

Buck, Steven, Craig McIntosh, Elisabeth Sadoulet, and Tomas Rosada. "Reputation in a Public Goods Game: Taking the Design of Credit Bureaus to the Lab."

ACTIVITIES

Coffee cooperative survey.

We field tested a preliminary version of the survey to be administered to coffee cooperatives and their members, and are revising the instrument.

Preliminary surveys in 2007-08 convinced us of the importance of hiring professional, local help in this process. The survey used census information from which to draw a sample. This dissuaded us from pursuing a set of “representative” farmers in survey areas. Also we learned the extent to which cooperatives are politicized entities, as well as the sensitivities provoked by substantial drug money laundering in Guatemalan coffee markets. In a surprising number of cases, cooperatives do not keep (or at least share) written records. This severely limits the institutional sources of available data.

In response to these difficulties we reoriented the sample and design of our survey. First, the survey focused entirely on cooperatives. Next, we leveraged to the fullest the excellent data provided through the connection with Fedecocagua, providing an extensive institutional panel that can be connected to the survey. We did this by surveying every single sub-cooperative of Fedecocagua, and then a sample of the remaining coffee cooperatives in the country.

A cooperative is a well-defined legal entity in Guatemala so this provides a clear sampling frame. Perhaps most importantly, we hired Guatemala’s *Instituto Nacional Estadísticas*, the primary public survey firm, to conduct the survey. We believe this design represents a realistic set of adaptations to the difficulties encountered in the preliminary field phase of this survey.

Savings innovations in *Credito Hipotecario Nacional (CHN)*. A randomized, cross-branch evaluation with CHN, the country’s largest public bank, investigates a different policy for building liquidity among Guatemala’s poor entrepreneurs: savings for microfinance clients. We have been

carrying out a multi-stage randomization of the types of savings products offered new borrowers.

CHN is unusual for microfinance in being both a fully certified commercial bank while also giving microfinance loans for 18 or 36 months, thereby triggering decision-making over an unusually long time horizon. It therefore serves as an interesting institution in which to test fundamental theories of behavioral economics and to test concrete product design, which is directly profitable for banks while broadening the financial services available to microfinance borrowers.



We stratified the branches of the organization according to loan volume and randomly assigned each to one of three treatments. The *libre* treatment gives microfinance borrowers a promotion for the use of CHN’s interest-bearing savings account, and nothing else. We expect this treatment to be relatively ineffective and therefore to serve as a control for the treatments of interest: the *fijo* and *estandar* products.

Fijo offers microfinance borrowers starting new loans the opportunity to add on top of their standard loan payment an additional amount that will be automatically directed to their newly opened savings account. *Estandar* informs clients that the

standard policy is to take payments that are 10% higher than the loan plus interest, and to put this into savings; clients are free to change this amount, but if they take no action then the default is to save.

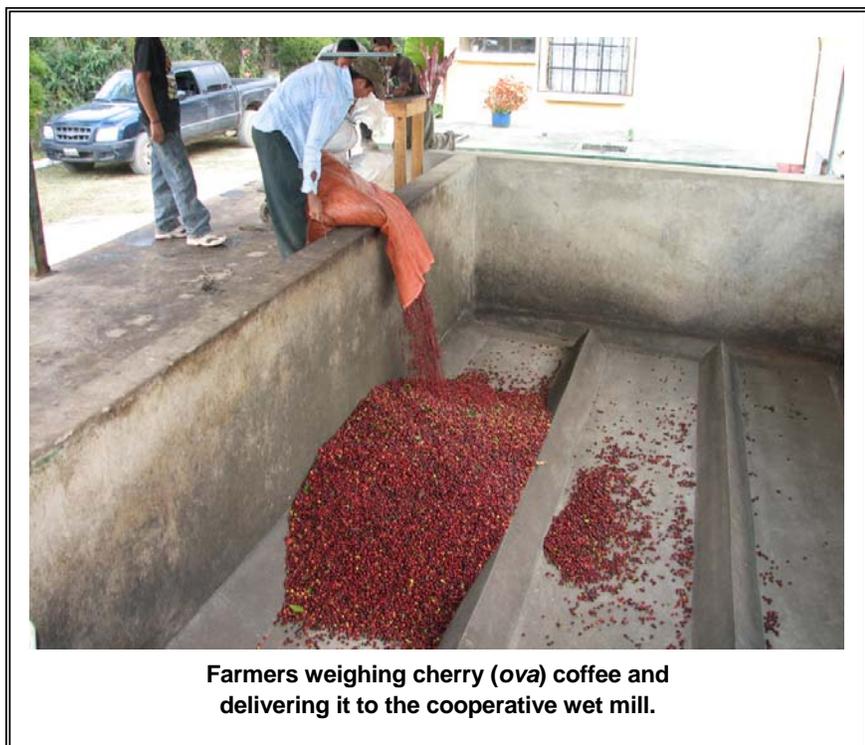
Attention in recent years has increasingly turned to savings, rather than credit, as a key to long-term asset formation in the developing world. In this sense, the rural, poor clientele of CHN allow us to examine whether commitment savings interventions provide potential institutional pathway to solving problems of liquidity and intertemporal decision-making in this population. Furthermore, with a global liquidity crunch underway, lending institutions in countries like Guatemala will increasingly need to raise their own lending capital through savings mobilization. Thus credit and savings are likely to become more intimately linked.

Fedecocagua. Fedecocagua, a second-level coffee cooperative with almost 20,000 small-scale coffee farmers as members, gave us ten years of institutional data. These data allow us to look deep into the complex contracts that link cooperative Guatemalan farmers with international markets. This database provides a unique intensive margin for analysis of Fair Trade and sheds light on the ways in which higher-tier institutions write forward contracts to provide both insurance and credit to cooperatives.

This institution has unique potential in terms of understanding the relationship between contracting and local economic benefits for poor smallholder farmers. Its membership is a collection of more than 135 collectives, representing almost half the cooperative-grown coffee output from Guatemala. It is the only entity in the world to have been granted indirect Fair Trade certification, meaning that each of its sub-members' coffee can be sold as Fair Trade without direct certification. The fact that it decides to sell only a relatively small fraction of its output as Fair Trade (roughly a quarter) provides us with a unique opportunity to observe an *intensive* margin decision over Fair Trade sales. Otherwise, the typical pattern is for producers who have taken on the costs of Fair Trade certification to sell 100% of their output as Fair Trade.

We were granted complete access to the institutional data of Fedecocagua, covering 10 years of sales of Fair Trade, non-Fair Trade, and organic coffee. This database gives the quality, price, quantity, and timing of delivery of all coffee that moves through Fedecocagua.

Analysis of consumer demand for Fair Trade coffee. We acquired weekly sales data of coffee by detailed product type in Safeway stores, but had only average prices rather than shelf prices. This is not sufficient for our analysis, so we requested complementary price data, as well as individual



consumer data rather for the subset of specialty coffees.

Upon receipt of the data requested, we will be able to perform the planned analysis of consumer demand for specialty coffee products as a function of coffee prices and coffee attributes (labeling, brand, certification). We will be able to assess consumer valuation for fair trade certification, organic certification, as well as similar social and environmental impact claims.

OUTREACH AND TRAINING

We hired a data expert to create a sophisticated, linked version of the many Excel spreadsheets that Fedecocagua had previously been using. We will share this more powerful database with them as a part of our research collaboration, and we will help install a working version of the system there.

As part of the launching of the new savings product by the CHN bank, we organized a day of training for all their microfinance credit agents, with 38 credit agents and 13 supervisors coming from all over Guatemala. We also prepared the promotional material and the administrative material now used by the bank.

FINDINGS

Coffee value chain. For the Fair Trade cooperatives, organized producers obtain an aggregated benefit of quality classification at the processing mill level, the fair trade premium and to a small extent, speculation benefits at the export level when compared to non-organized producers.

At the federation of cooperatives level, coffee is processed in their own mill and they can differentiate coffee and obtain certifications such as Fair Trade. This makes the price differential higher compared to that to which an exporter could sell coffee without certifications.

Fair Trade exporters very strongly suggest that cooperatives not speculate with coffee, but cooperatives have different strategies to set a price. Most cooperatives sell coffee in a combination of setting a strike price, bringing their coffee as a response to a need of cash and fixing their price in advance on a percentage of their production in exchange for credit.

The strongest incentive for the exporter to pay a fair differential to the fair trade producer comes from international monitoring, which affects exports demand.

There are 171,334 coffee producers in Guatemala, out of which 33,330 are in Huehuetenango. Four of the largest producers produce 50% of Huehuetenango total production, while producers with fewer than nine acres produce less than 1%. There are 15 processing mills in Guatemala and these processing mills are also exporters, selling, processing, labeling and trading coffee.

Benefits derived from certification and quality differentials are available for large producers and organized smaller producers.

Exporters keep between US\$11-15 per 100 pounds of green coffee exported, therefore they benefit from volume. The benefit to exporters is any difference between these \$15 and the expenditures they have derived from the dry benefit process and others.

Price is mostly determined by the market. Both importer and exporter look at the coffee “C” prices and negotiate the quality differential. The differential depends on the specification of coffee

-
- International monitoring is the strongest goal to exporters to pay a fair price to Fair Trade producers.
 - The four largest producers produce 50% of coffee in the Huehuetenango department of Guatemala, while smallfarmers produce less than 1% of the total in that region.
 - Technical assistance offered by cooperatives to farmers was not as important as expected.
 - Most coffee growers are not members of savings cooperatives.
-

and in a lesser extent in volume.

Small non-organized farmers are at the end of a chain at which every level involves information asymmetries. The lack of economies to scale to benefit from mechanisms to decrease these problems acts as a barrier to entry to the differentiated market. Fair trade decreases this problem, but demand is not high enough to make a difference for most smallfarmers.

Coffee producer survey. Initial findings from this survey of producers in San Pedro Necta, Huehuetenango, include some surprises. We did not find as large of a difference between cooperative and private intermediary prices as we expected. In fact, there is quite a bit of competition between the private intermediaries to offer a better price.

The most common reason to be in a cooperative was access to credit based on the amount of coffee to be delivered.

Technical assistance that the cooperative offered was not as important as we expected. All coffee growers had more or less the same level of technology.

There were many reasons *not* to be in a cooperative. (1) Growers do not receive full payment upon delivery, which dissuades many poor growers from joining a cooperative. (2) Private intermediaries pick up the coffee on the farm while cooperative members must deliver it to the cooperative. (3) There is a fine, taken off the price received, when a member does not attend the required monthly meetings.

There is not a big difference between cooperative and non-cooperative membership on the savings behavior of coffee farmers. Most of our subjects do not save because not only do they lack access to savings institutions, but they also lack the ability to save. Although cooperatives do not have formal savings services, they do have a form of retirement fund where coffee growers can deposit a portion of their income into this account and withdraw their money at any time. Under the cooperative law, coffee cooperatives cannot collaborate with savings cooperatives. However, coffee growers can be become members of savings cooperatives. We found that most of the coffee growers are *not* members of savings cooperatives.

A brief look over the data suggests that the average educational attainment does not surpass 6th grade for the children of coffee growers. We do expect to find higher education level among the children of wealthier coffee growers independent of cooperative membership.

Case study of Guatemalan producer groups in the non-traditional export sector. Interviews with top level organizations indicated that we should consider other types of producer groups in addition

to cooperatives. We learned that *asociaciones civiles* (similar to non-profit organizations in the United States), rather than cooperatives, accounted for the largest share of producer groups in the NTX sector (not including differentiated coffee).

Compared to agricultural cooperatives, the number of agricultural *asociaciones civiles* have grown dramatically since 1998 when a new law permitted *asociaciones civiles* to register at the local level rather than requiring registration in the capital city. However, cooperatives and *asociaciones civiles* do not appear to be significantly different production models since both are subject to similar tax laws as well the same contract farming with exporters.

While contract farming seems to have helped many Guatemalan farmers, there is a large portion of smallholder farmers and their respective producer groups that are dissatisfied with selling to exporters rather than exporting themselves. Therefore, some producer groups (cooperatives and *asociaciones civiles* alike) are trying to form *alianzas* among themselves with the goal of someday exporting directly to US and European markets. Interviews with smallholders found that lack of business knowledge and quality standards as well as limited access to credit and capital are the main obstacles to directly exporting.

The case study suggests further research on producer group *alianzas* and the obstacles they face. More specifically, research should evaluate how producer groups might benefit from programs aimed at overcoming market obstacles. Candidates include the new government supported microcredit and microinsurance program, DACREDITO, as well as NGO sponsored technical assistance programs focused on transmitting good business practices to smallholder farmers.

WHAT'S NEXT

Coffee cooperative survey. Building on the preliminary version of the survey described in the activities section, we will extend the survey to all of the member sub-cooperatives of Fedecocagua, as well as a random sample (roughly 50%) of the remaining coffee cooperatives in Guatemala. The survey features two levels: one survey of the cooperative management describing the formal activities and decision-making of the cooperative as a political entity, and the other a household survey with a random sample of the membership of the cooperative. The “socio” survey focuses not only on typical household outcomes, but on *knowledge* of the workings and contracts of the cooperative, as well as farm-level variables such as the total potential output of the farm. This design is in response to the strategic sensitivities of sales information among coffee producers in Guatemala. The survey reached all of the members of Fedecocagua as well as a randomly sampled half of the additional cooperatives.

With this survey we can deepen the Fedecocagua institutional data, where the cooperative is the unit of analysis, with direct survey data. Some of the research questions at this level are:

- Which factors in the Guatemalan coffee market are pro-poor? Which kinds of market interventions have the best targeting the poor?
- Do cooperative characteristics like education, inequality, and governance structure drive the contract terms received by the cooperatives?

The other use of this survey is analysis at the level of the socio’s household, thinking of the cooperative as an intermediary institution between the farmer and the marketplace.

- What drives the decision to sell through the cooperative versus selling on the side market to coyotes?
- What factors drive the farm gate prices received by socios? Do cooperatives in which the level of education among socios is lower, or the

disparity in education between the socios and the cooperative management, pass lower rents to the socios?

Credito Hipotecario Nacional. Over the next year we will rotate the three treatments (*libre*, *fijo*, and *estandar*) through the branches of CHN. The products are only offered to borrowers taking *new* loans, and so this rotation of loans creates a cohort design whereby clients making payments on a given month in a given branch received different treatments. By August 2009 the rotation will be



CHN microfinance clients selling bananas and tomatoes in Chichicastenango’s central market. Juan (center in hat) took out a small loan to pay for better fertilizer and tools.

complete, we will prepare a report for CHN and expect them to have implemented best practice. The cohorts created by the study can continue to be analyzed for the entire three-year horizon of the loans.

We will conduct take-up surveys in the branches at the time that borrowers are making the decision over whether to enter into the commitment product. This will help to understand the demands for commitment, and provide as baseline data for a detailed cash-flow survey to be conducted in the final year of the project.

Fedecocagua. The dataset from Fedecocagua is now in hand. We are formalizing a theory

suggesting that a Fair Trade certification mechanism that has no real supply side constraint will suffer from over-entry until rents are bid down, and that the fixed price mechanism in the Fair Trade mechanism may act more powerfully as an insurance device than an improvement in average price.

The Fedecocagua data will be used to test the following propositions:

- As the premium on coffee quality increases, a non-quality discriminating contract such as Fair Trade will show a lower average quality.
- Cooperatives are willing to sell coffee at a loss through the Fair Trade mechanism during price spikes (they use the Fair Trade contract to purchase insurance).

The Fedecocagua data provide an error-free measurement of contract variation across 10 years and 85 cooperatives, and thus a unique window on these questions. We cleaned and prepared the database and now will prepare a paper with theory and empirical tests.

The competition project. BanRural is signing the contract giving us access to their data. We already

have institutional data from BanCafe and Genesis, which gives us all three of the large microfinance lenders contributing data into the country's credit bureau. We can use a technique that combines approaches from several empirical papers to analyze these data.

We will conduct a mapping exercise that will allow us to overlay the branches of different lenders spatially. The research question then is this: does the presence of the bureau mitigate competitive pressures that otherwise emerge in the marketplace?

We can watch the effects of competition at the branch level (given by number of loans in competitors' adjacent branches) on loan repayment in the era before the bureau was in place. The hypothesis is that the effect in such markets is negative, meaning that default increases as indebtedness to other banks increases. Then, we can track as the bureau is introduced across the branches of the lenders in the system to see whether these negative effects are mitigated when the major lenders in these markets share information with each other. The staggered entry of the branches of Genesis into this bureau provide a source of identification for this exercise.

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, including the use of biometrics to improve repayment and the effect of interest rates on financial market participation, which will 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.

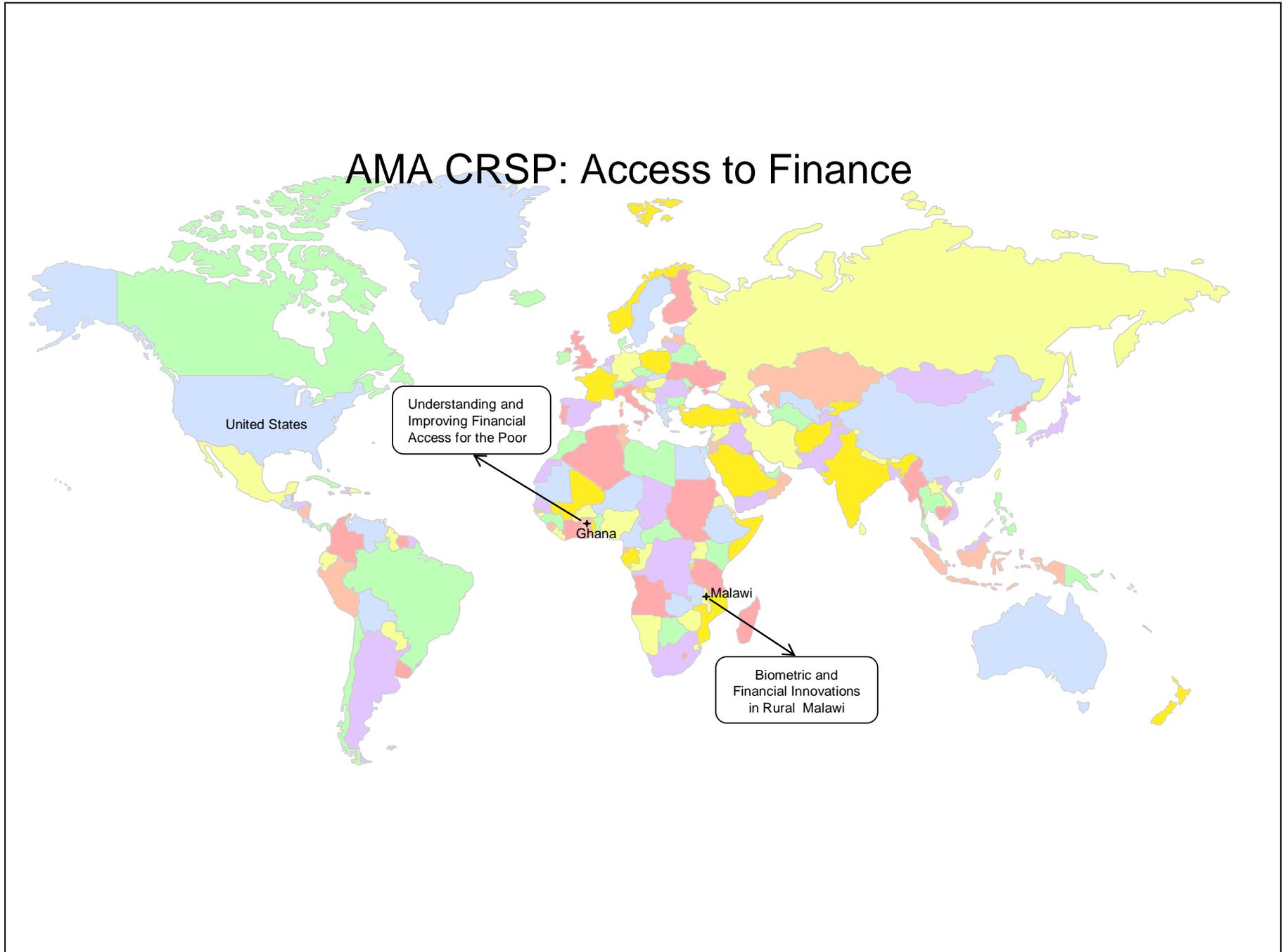
AMA PROJECTS

- Understanding and Improving Financial Access for the Poor (Ghana)
- PILOT: Biometric and Financial Innovations in Rural Malawi: A Field Experimental Approach

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. May 2008.

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

THE GOAL OF THIS PROJECT IS TO IDENTIFY THE MICROFOUNDATIONS of the demand and supply of financial services for the poor so that better innovations can be designed to help individuals accumulate assets and cope with risks. To arrive at such policy prescriptions, our projects address three sets of questions:

- What demand and supply mechanisms create incomplete access? For example how do interest rates, premiums, and other contract terms affect financial access? How do psychological and social barriers affect access to savings?
- Which innovations are effective in expanding access?
- What are the welfare implications from interventions that expand access to financial services?

We experiment with various innovations focusing on product development, product presentation (marketing), contracting, and risk assessment. Several of the field experiments in our project take advantage of a unique panel dataset funded by the Economic Growth Center (EGC) at Yale, and by the Millennium Challenge Corporation under its Millennium Development Authority (MiDA) compact with the government of Ghana. This database help track medium- and long-term changes, or lack of changes, during the process of development. The project will also undertake a new comprehensive household survey of 5,000 households in 341 enumeration areas (EAs) in Ghana, in collaboration with the Institute of Statistical, Social and Economic Research at the University of Ghana (ISSER), and the Ghana Statistical Service (GSS).

ACTIVITIES

Interest rate sensitivity. We partnered with Opportunity Ghana to conduct direct marketing of an individual loan product to microenterprise owners in the Greater Accra metropolitan region. Four different interest rates were tested, one of which is higher and two of which are lower than Opportunity's normal rate for individual loans. Rates were assigned within a predetermined range by the lender based on their market research. We tracked take-up rates, loan amounts, repayment rates, and client retention achieved from the various offers.

Account officers and survey teams collected observational and self-reported measures of the (potential) borrower's household and business. Operating in a range of physical environments (ranging from rural to urban, remote to central, agricultural- to service-dominated) enables us to shed light on how product markets and location affect price sensitivities.

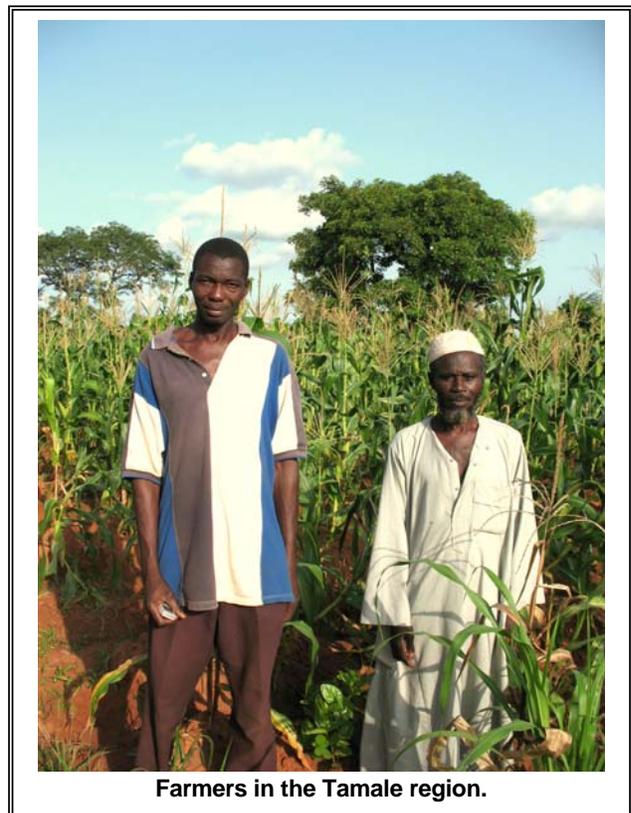
Each potential client either is new to credit, has a loan at another institution and takes a second loan through the credit offer we are studying, or has a loan at another institution and switches lenders to take advantage of the credit offer we are studying. To identify into which category the potential client falls we conducted a follow-up survey on all those offered credit. Analysis of results will enable us to distinguish an expansion of financial access from crowd-out of other borrowing.

A second pilot phase of this study was developed to better understand take-up patterns and the constraints facing potential clients. In this phase, a few key requirements were relaxed. Spousal signatures were not required, an extensive review of guarantor finances was not required, and personal collateral was accepted. These changes were aimed at minimizing the barriers to credit access and increasing take-up of the promotional loans. Surveyors interviewed 212 small business owners and marketed the promotional loans with Opportunity Ghana at randomized interest rates. Forty-nine of those interviewed visited the branch to inquire about the loan and 17 started the loan application process.

We conducted a follow up survey with those 163 individuals offered a loan at the randomized

promotional rate but who never visited the branch, and also those 32 who visited the branch once but did not initiate the application process. We hope these informal interviews will provide more information on the barriers to access and deterrents facing potential clients. We hypothesize that some of those interviewed have other loans already, whether formally or informally, but were not forthcoming with this information. We hope to better understand their access to and interest in credit.

Underinvestment in agriculture. Managing business and personal finances can be an immense challenge for rural farmers, whose financial fortunes are frequently determined by forces beyond their control, such as weather and crop prices. Farmers who might increase their productivity and incomes by making new investments in agricultural inputs can be wary of the risk. In Ghana, where 52% of Ghana's population lives in rural areas and 44% of the rural



Farmers in the Tamale region.

population lives below the poverty line, the situation seems particularly acute. By examining how insurance products and capital shocks impact farmers' investment decisions, this study will distinguish between the affects of risk aversion and of capital constraints.

Three districts in the northern region were selected for the study, based on their being a MiDA district, having regular and reliable rainfall data collected at a meteorological station and the affect of rainfall changes on local farmers. Complete lists of maize farmers were collected from the sample in Tamale, Wale Wale and Savelugu districts. Detailed surveys have been completed at the household level, which will serve as a baseline.

Maize is the focal crop because it is widespread in the three districts, sensitive to rainfall and inputs, and grown by farmers of all socio-economic levels. Maize is mostly grown for consumption, and many farmers listed food security as a big yearly concern, implying that the success of a maize harvest is very important. The 470 maize farmers selected for this study were randomly allocated into groups receiving different marketed products. Some received a direct transfer of capital (116 farmers), some an insurance product (116 farmers), and some both the transfer of capital and the insurance product (84 farmers). A fourth group of farmers received no treatment and is monitored as the control group.

The exact amount of capital provided to each farmer was roughly around 200 Ghana Cedis. The northern region farmers listed many different things they could invest in to increase their yields, including fertilizer, new seed varieties, rental or purchase of more land, rental of bullocks or a tractor for plowing, and more by-day labor.

The insurance product is for rainfall. Farmers repeatedly listed rain as a key determinant of the success of a harvest. For example, in a bad year there is drought, or the rains come late and so planting is late. Both too much and too little rain can spoil a harvest.

The outcomes to be measured include size of farm plot, number and variety of crops planted, inputs used, including equipment, labor, chemicals, and seeds, amount and value of crops harvested, and household income, consumption, and nutrition.

We held focus groups sessions with farmers in the northern and eastern region of Ghana. These helped to gain a better understanding of the risks and challenges facing them, and whether crop price or rainfall fluctuations are of greater concern. It was clear that rainfall was a far greater concern in the north and that maize was more widely farmed and thus a better target.

A detailed listing of existing crops and average yields was collected, along with information on the market for various regional crops and the input costs per acre for different crops.

Information about marketing insurance products, prices of insurance products and rainfall data was



Inspecting a maize field. AMA researchers are learning ways that financial products might reach more farmers.

collected. Historical rainfall data helps inform the specific insurance product design. The pilot began early 2009 at the beginning of the major farming season in the Eastern Region. The pilot focuses on purely operational areas, such as explaining insurance products and the best way to disburse capital, and not attempting to estimate impact.

Credit and crop insurance for farmers. Lenders are extremely wary of extending credit to farmers, fearful of farming's inherent risks. In the region where Mumuadu Rural Bank (MRB) operates, an estimated 70% of households make a living in the agricultural sector, but agricultural loans make up only 2% of the bank's loan portfolio. We developed an agricultural loan product with an insurance

component that partially indemnifies farmers against low crop prices. The goal is to reduce farmers' risk in investing in agriculture inputs and thus encourage them to make investments.

We compare the effects of this new product to the effects of the current agricultural loan product. We can examine which combination of loan product and financial literacy education promotes the highest take-up and repayment rates, and how these indicators vary by risk aversion, attitude towards banks, and cognitive ability. Household surveys and measures of farm output determine the impact of the intervention on crop yields, farm profits, and household consumption.

A pilot phase marketed loans to 201 maize and garden egg farmers, in which 100 farmers were offered the opportunity to apply for a standard agricultural loan, while the remaining 101 "treatment" farmers were offered a variation of the agricultural loan product that included an insurance component: if the average crop price during harvest season fell below a pre-defined price floor, 50% of the loan and principal would be forgiven.

Savings account labeling and financial literacy training. *Susu* collectors are one of the oldest financial groups in Africa. For a small fee, they provide people an informal means to securely save money and gain a limited access to credit. We studied the response to a new savings product aimed at *susu* customers, by comparing the effects of this new product to the effects of the current *susu* savings product. This is a purely psychological savings product that allows labeling of funds within an account so that deposits can be directed to a specific goal—for example, "Health Savings," "Education Savings," "Business Savings." Each client will be asked to state his or her goal for savings—the amount of money he or she hopes to have saved within the next six months.

Susu agents gave financial literacy lessons to a random selection of customers, and we looked at how financial literacy education impacts the decision of a customer to open a labeled savings account or not. Which combination of savings accounts and financial education promotes the highest rate of take-up and larger and more frequent deposits?

A pilot tested the study methodology and made necessary operational adjustments. Based on the outcome of the pilot, we trained *susu* savings staff

to randomly market the six different savings account products to approximately 4,500 active and 2,000 inactive individual *susu* customers. We will track take-up and savings over time among all *susu* customers and then compare savings levels among all groups. New and existing customers will each be randomly assigned into one of six groups to be marketed savings accounts. All participants will be randomly assigned to receive financial education or not. A follow-up survey after one year will assess the impact of account labeling and financial education by gathering information on customers' consumption patterns.

Comparing the savings level of different groups will show the impact of account labeling on savings behavior. The project will show whether account labeling is an effective way to increase deposits and savings levels among MRB customers. We also will examine how the labeling changes expenditure for clients—for example, do those offered health accounts end up spending more on health care?

Business management consulting. We undertook a study aimed at understanding what prevents small and medium businesses from expanding and developing, what management hurdles prevent businesses' growth, and if consulting services make a difference in business profits and growth.

We selected 160 Accra-based businesses, 80 of which received intensive consulting services free of charge for one year. After six months, a random selection of 80 businesses then received \$200 to invest in their business. Follow up surveys with the 160 participating businesses will measure the impact of the consulting services and the added capital on the businesses and the entrepreneurs.

Individual liability. This study examines the effects of making existing clients individually liable for their loan repayments. We randomly selected a sample of 100 of Opportunity Ghana's credit centers in Ghana, representing 150,000-200,000 clients. For half of these centers, the group liability feature will be removed, making clients individually responsible for the repayment of their loans. We met with group loan officers and branch managers to discuss the group and center transition, and logistics for the study.

This project makes a sample of existing group loan clients individually responsible for their repayments, and investigates whether the lessons of that study are more widely applicable. Thorough

investigations of these questions will enable microfinance institutions better to evaluate the relative merits of group and individual liability lending schemes.

In the study, individuals are no longer held responsible for the repayments of their fellow group members. Half of the treatment and half of the control group are offered a “cash back” incentive, promising clients a monetary bonus if they keep up with their repayment schedule. Individual-level repayment data for all clients included in the study allows us to examine the impact of the liability change and the cash back incentive on clients’ repayment and retention. A baseline survey aimed at evaluating the depth of specific clients’ social capital within the credit center has been conducted.

Dynamic incentives. This study was designed to understand if, how and why two new products—designed to increase the speed with which existing clients can access more capital— affect client retention and repayment rates. Would client retention rates change with faster accessibility to capital?

We tested two new products. One is the Fast-Track Facility, in which a follow-on loan is disbursed within 48 hours of final payment on initial loan. The other is the Top-Up Facility, in which the client has the ability to increase the outstanding loan balance halfway through follow-on loan cycle. Approximately 2,400 existing individual loan clients were randomly assigned into three equal-sized groups: Fast-Track, Top-Up, and control.

FINDINGS

Interest rate sensitivity. The individual loan was marketed to 3,200 potential clients. The graph shows that take up was very low. Of the 214 small-business owners targeted for the survey and promotional loan product:

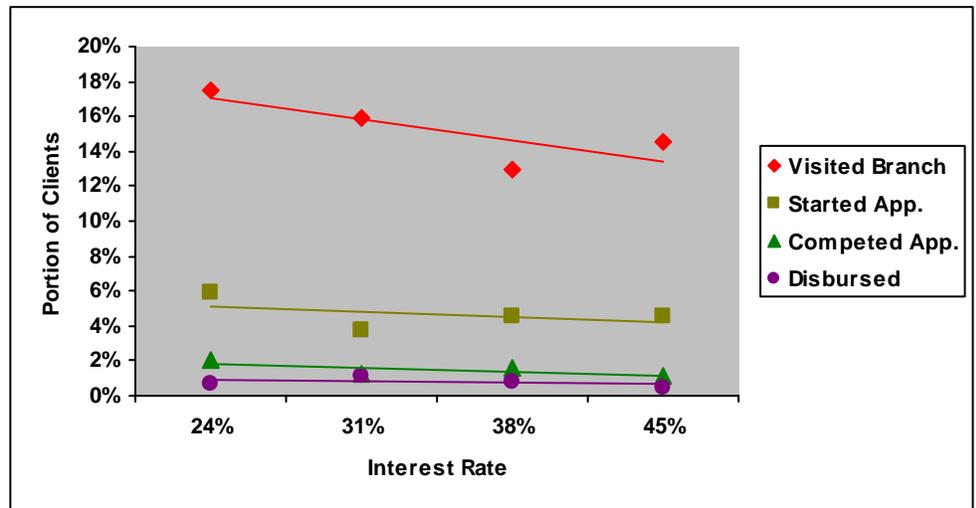
- 42 (20%) visited the Opportunity Ghana branch to express an interest in applying for a loan
- 17 (8%) opened a deposit account, the first step in making a loan application

- 10 (5%) already brought a guarantor and had him/her approved by the loan officers, so appear very likely to take out a loan.

Around 5-7% of those new clients marketed a loan will follow up and successfully receive a loan. We anticipate that with additional reminders we can increase this take-up closer to 8 or 9%.

Nonetheless, the lesson learned here is that the door-to-door marketing method requires a great amount of time and labor and does not result in substantial new numbers of clients.

Credit and crop insurance for farmers. Take up of both the treatment and control loan applications were unexpectedly high, measuring at 83% and 86% respectively. With average loan size at 242 GHS (\$256.02 US Dollars), the loan represents a large change in cash flow (roughly 20-60% of typical farmers' average annual income) that can allow farmers to make potentially profitable



investments that had been prohibitively expensive. This can increase the poor’s access to productive capital that can be invested in activities that increase their incomes, and can mitigate risk (crop price shock) that is a major contributor to poverty. Preliminary data reveal that those with less formal education were turned off by the loan product that included price indemnity insurance, more so than those with higher education. This indicates a potential important role for financial literacy.

WHAT'S NEXT?

Interest rate sensitivity. Data analysis for this project will take place, and deliverables include a research paper, a policy memo targeted at practitioners, and a presentation made to Opportunity Ghana to share the research results and discuss implications.

Underinvestment in agriculture. The full launch will begin in time for the major farming season in the northern region, in early 2009. The goal is to market the insurance product and provide the capital before clearing of land begins, as the amount of land farmed is one possible investment area and an outcome we will like to monitor. We will carefully explain and market the insurance product and/or capital drop to selected farmers. A follow-up survey after the harvest will document the farmers' acreage, investments, yield, and household level data.

Credit and crop insurance for farmers. We planned a full launch of the project to include marketing loans to 2,800 farmers, indicating a commitment of approximately \$470,000 in total loan capital. However, MRB determined that providing the required funds for loan capital was not in their capacity, and therefore it was no longer interested in continuing with the project.

Nonetheless, we will conduct a short survey with farmers to learn what they did with their crops, in order to learn whether the crop price insurance enabled farmers to take on riskier but more profitable endeavors. The pilot provided enough information to answer important research issues. Although the differential take-up was minimal, the fact that it was so high has a big advantage. We will study whether getting the crop price indemnity loan led farmers to take on riskier crops.

Savings account labeling and financial literacy training. The full launch of this project includes training all *susu* agents in new product marketing and study design, and beginning to market the

product. Financial education training will be provided *susu* agents, who then will begin six weeks of financial education training for clients.

Business management consulting. The full launch and business management services will continue for 12 months. Roughly at the half way point, capital will be given to half of the sample. The endline survey will be conducted in January 2010. Individual level data will be collected.

Individual liability. Each month all loan officers will be given a list of clients whose final loan payment falls in the coming month and who have been assigned to one of the two treatment groups. Selected clients will be offered these products through July 2009. After that point the promotions and benefits of both products will still apply as appropriate. We will continue to collect data on retention and repayment behavior of the entire sample through July 2010.

Health insurance. We are still looking for a partner for implanting a health insurance project. The goal of this project is to address the extent of adverse selection, and the impact of having access to health insurance on a number of variables, including borrowing behavior.

Financial education. The goal is to look at how individuals choose what financial services and products to use, and how individuals make the best use of the products to which they have access. We will conduct randomized controlled trials in which we offer different models of financial literacy training to the general adult population and a control group that is not offered training during the study period.

Using the Yale Economic Growth Center panel dataset we can follow up to determine the impact of financial training (and particular types of training) on household welfare and financial decision-making.

BIOMETRIC AND FINANCIAL INNOVATIONS IN RURAL MALAWI: A FIELD EXPERIMENTAL APPROACH

Principal Investigators

Xavier Giné, World Bank

Jessica Goldberg, University of Michigan

Dean Yang, University of Michigan

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

THIS PROJECT AIMS TO DEMONSTRATE HOW BIOMETRIC TECHNOLOGY can help improve the functioning of rural credit markets in Malawi. The project asks whether fingerprinting of borrowers coupled with the use of fingerprint-based credit history databases can help lenders withhold credit from past defaulters, as well as expand credit to borrowers who have proven reliable.

If farmers believe that biometric identification raises the cost of default, it should deter some farmers from borrowing in the first place (specifically, those with private information that their likelihood of default is high). When the consequences of default are higher, farmers may use more inputs and exert more effort to reduce the probability of having to default on the loan.

The most obvious area of impact is if farmers are likely to repay since the consequences of default are higher. A credible experimental estimate of this effect can be used in cost-benefit analyses of investments in biometric technology by rural lenders.

ACTIVITIES

Nearly all the stages of the project have been completed. Experimental protocols were finalized, and the educational module and survey instrument were field tested. We held orientation meetings with farmers, and loan applications and baseline survey forms were filled out. Finally, the farmers in the treatment group were fingerprinted, and the Malawi Rural Finance Company disbursed loans.

With the loans, farmers could purchase inputs to apply to their paprika plots. We conducted a follow-up survey of farmers on their use of inputs and other farming practices. All farmers (treatment and control) were reminded about the importance of credit history, and farmers in the treatment group were reminded that fingerprinting will make enforcement against defaulters easier.

In total, 3,474 farmers in 251 clubs were part of a baseline survey in 2007, and the re-survey covered 1,747 farmers and 224 clubs in the first follow-up in April and May 2008. This relatively low re-survey percentage in the first follow-up is to be expected, given that April and May are very busy months leading up to the harvest. We expect higher re-survey percentages in the more important second follow-up survey.

FINDINGS

Were fingerprinted farmers more likely to have their loans approved by the lender? Were they more likely to take out loans, compared to the control group?

Administrative data on completed loan applications indicates that treated (fingerprinted) farmers are no more or less likely to take out a loan: the percentage was nearly identical across the treatment and control groups (39.0% and 38.9%, respectively). Also, there is no indication that fingerprinting induced differential approval by the lender.

While there is no indication that the pool of ultimate borrowers was itself substantially affected by fingerprinting, it does appear that fingerprinted borrowers took out smaller loans, and this was

particularly true for borrowers with the lowest expected repayment. It appears that this effect is confined exclusively to borrowers in the lowest quintile of expected repayment, where fingerprinted



Demonstrating to use of fingerprints to farmers.

borrowers take out loans that are smaller by MK2,722 (roughly US\$19) than those in the corresponding quintile in the control group. Differences in other quintiles are small and not statistically significantly different from zero.

We view this result—voluntarily lower borrowing amounts on the part of fingerprinted borrowers in the lowest quintile—as evidence that fingerprinting reduces adverse selection in the credit market.

The existing literature tends to emphasize that improved enforcement should lead low-quality borrowers to be excluded from borrowing entirely. Our result, that borrowers in the lowest quintile of predicted repayment voluntarily take out smaller loans, leads the overall loan pool in money terms to be less weighted towards the low-quality borrowers. Improvements in repayment among fingerprinted borrowers (particularly among those in the lowest quintile) may in part result from their decisions to take out smaller loans at the very outset

of the lending process and improve their eventual likelihood of repayment.

We also examined farmer decision-making. One of the first decisions that farmers make in any planting season is the proportion of land allocated to different crops. The impact of fingerprinting on this outcome appears focused on borrowers in the first predicted-repayment quintile. In this group, fingerprinting leads to a reallocation of land towards paprika (which sees an increase of 7.1% of the farmer's land area) and away from other crops (particularly maize, with a reduction of 8.3% of

-
- **Fingerprinted borrowers took out smaller loans, which may prove to improve their repayment rates. This was especially true of borrowers with the lowest expected likelihood of repayment.**
 - **Fingerprinting led to higher application of inputs on paprika fields.**
-

land area). Fingerprinting also causes a small (0.7% of land area) increase in leafy vegetables.

The other major farming decision made by farmers is input application. The results for paid inputs indicate that, particularly for farmers with lower likelihood of repayment, fingerprinting leads to higher application of inputs on the paprika crop. Results for inputs not purchased in the market are either nonexistent or ambiguous. For the lowest predicted-repayment subgroup, fingerprinting causes total input expenditures to be higher by MK6,541 (US\$47), which is substantial compared to the mean in the lowest predicted-repayment subgroup of MK7,440 (US\$53).

Given these effects of fingerprinting on intermediate farming decisions such as land allocation and input use, what is the effect on agricultural revenue and profits? For borrowers with worse predicted repayment, fingerprinting leads to greater increases in market sales. By contrast, fingerprinting (on average or for the low-predicted-repayment subgroup) has no statistically significant effect on the value of unsold crop.



A farmer's fingerprint is recorded.

AMA RESEARCH THEME:
ASSET BUILDING AND PATHWAYS FROM POVERTY

ASSETS 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.

AMA PROJECTS

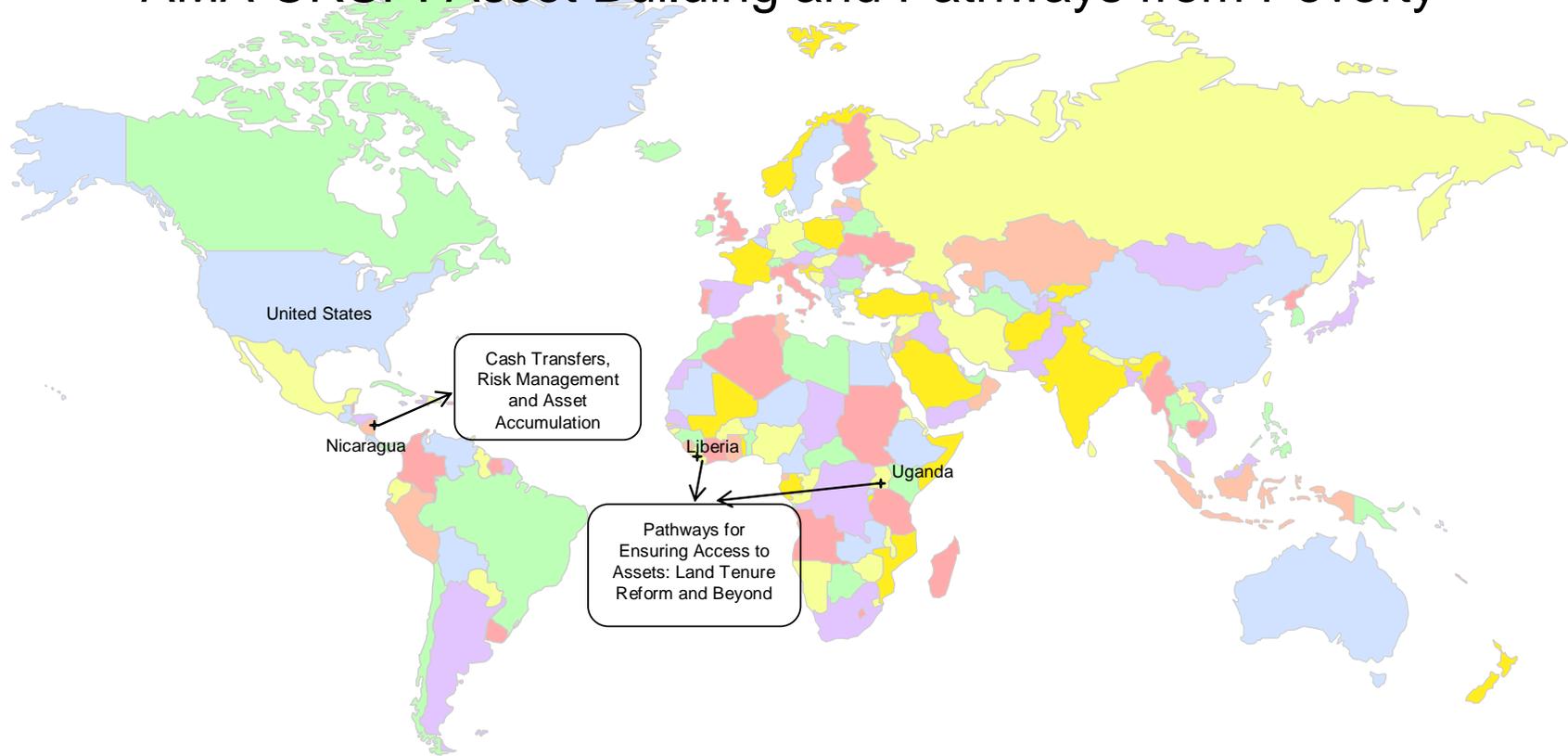
- Cash Transfers, Risk Management, and Asset Accumulation: Policy Evaluation for Rural Poverty Reduction in Nicaragua
- Pathways for Ensuring Access to Assets: Land Reform and Beyond (Liberia and Uganda)

AMA BASIS BRIEFS

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. July 2007.

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. July 2007.

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 HOUSEHOLD'S ASSET ENDOWMENT can create a pathway from poverty, while a shock, such as a drought, can deplete assets below a minimum threshold needed to avoid falling into a poverty trap. Families caught in such a trap can benefit from an intervention that lifts household assets above the threshold.

Among interventions aimed at increasing household asset endowments, conditional cash transfer (CCT) programs typically provide 10-30% of the household income in return for the family agreeing to invest in strategies to increase its human capital. By relaxing liquidity constraints, these interventions can improve a household's asset base and ability to generate income.

Many Latin American countries have adopted CCT programs to increase household investments in education, health and nutrition. These programs have the potential to enhance a rural family's risk-coping and management strategies. The programs can limit a shock's impact by decreasing the need for coping mechanisms such as selling assets, pulling children out of school, or reducing consumption to the point that it causes nutritional deficiencies. The programs also can result in asset accumulation and income diversification, reducing vulnerability to shocks while creating the potential for long-term upward mobility.

A recently completed pilot program by Nicaragua's Ministerio de la Familia (MIFAMILIA) offers AMA a unique opportunity to analyze the effectiveness of CCT programs in facilitating households' risk management, asset accumulation and income diversification capabilities. We also look at the impacts of complementary interventions that we design and pilot. In parallel with these research activities, the project contributes to local capacity building through short-term training courses and long-term degree training. By providing direct evidence about the effectiveness of different types of interventions, this project will inform policymakers and other stakeholders in charge of social policy and rural development in Nicaragua.

Additional outputs

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." Mimeo, Johns Hopkins University and World Bank.

Del Carpio, Ximena, and Karen Macours. 2008. "Leveling the intra-household playing field: Compensation and Specialization in Child Labor Allocation."

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

Pilot interventions. Information from qualitative field work was combined with results from a short-run quantitative evaluation to identify two complementary pilot interventions.

Enhanced information dissemination and promotion of social learning related to basic commercial skills and risk management practices.

This intervention took place in 2008 in the form of information sharing workshops in a random subset of treatment communities.

Early childhood development (ECD) practices.

This intervention, targeted to a random subset of the original treatment and control communities, is an intensive one-year intervention based on workshops by trained community educators and regular home visits.

Third-round of panel dataset. The third round data collection started in July 2008 and was finalized by November. The objective of revisiting all the original households, as well as the households to which some of the members might have migrated, was to obtain indicators of the medium-term impact of the initial Mifamilia pilot, and short-term impacts of the complementary interventions. As a complement to the third round of the panel data collection, we created the design and training of protocols for experimental games aimed at observing decision-making regarding trust, collaboration, altruism and risk aversion.

Outreach. The findings of the initial quantitative impact evaluation, combined with the findings of the qualitative field work, were disseminated through a number of events, both in Managua and in international academic settings. Findings were presented to the staff of the Ministry of the Family and later to an impact evaluation workshop in Managua targeted at policymakers, civil society and donors from Nicaragua and other countries in the region. Research findings also were presented at academic and policy conferences at the Center for Global Development, IFPRI, World Bank and several universities.

We taught the technical component of a large impact evaluation workshop organized by the World Bank in Managua. Around 100 policymakers, ministerial staff, staff from civil society organizations, and donors from Nicaragua

and other countries in the region participated in this workshop.

Around 40 potential enumerators, the vast majority of them recent university graduates without prior field experience, were trained in survey methods, data collection, conducting of early childhood development tests, and experimental games.

FINDINGS

The short-term program impact on households' investments and accumulation patterns are affected by the proximity to female leaders, who themselves were also beneficiaries of the transfer program. We find large social spillover effects on human and physical capital accumulation and aspirations. This suggests that leaders might have played a key role in guaranteeing higher program impacts, and the change in attitudes might indicate a possible mechanism for sustainable impacts on the long-run.

-
- **Community leaders seem to have a key role in guaranteeing higher cash transfer program impact. This holds promise as a mechanism to achieve sustainable impacts.**
-

The CCT program had a positive impact on the cognitive development outcomes of young children, especially on language development. 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, suggesting that the program changed parents' behavior.

The program helped compensate for some intra-household differences in child labor allocation, as it reduces child labor in agriculture more for boys, in particular when they are older and further behind in school. Conversely, it reinforces specialization of girls in nonagricultural and domestic work.

WHAT'S NEXT?

Data collection and analysis. Data collection of the third round of the panel dataset including community, household, woman, and child level data will be complemented with data from experimental games on a sub-sample of all households, to be conducted early 2009.

The analysis of the third round aims at shedding light on the medium-term impacts of the original MIFAMILIA intervention. The research will focus on possible impacts of each of the three original interventions on household income diversification and risk management. It will also attempt to shed light on the heterogeneity of outcomes, in particular for the households that benefited from the vocational training courses, and for the households that received the productive investment grants.

The analysis will also look for any short-term impacts that might have resulted from the complementary information intervention. Building on the results of the short-term evaluation, we will focus on the impacts on early childhood development outcomes, on changes in attitudes and perspectives towards the future, and on changes in social dynamics.

The data from the experimental games will allow to shed more light on whether the intervention had long-term impacts on behaviors. Other research areas that will be explored are impacts related to gender empowerment, and human capital investments (schooling and child labor).

ECD pilot intervention. This will begin and last one year. It will be randomly assigned to households in the three original treatment groups and households in the comparison group. This will allow a rigorous evaluation of the complementary impacts for different types of beneficiaries. It also capitalizes on the prior rounds of data, allowing for a difference-in-difference and/or fixed effects estimation. The cognitive development outcomes

collected in 2008 serve as the baseline for this intervention. We likely will experiment with two different designs in order to be able to draw stronger conclusions regarding design features. A fourth round of data collection, now scheduled 2011 will evaluate the impact of this intervention.

In the complementary ECD pilot interventions, CIASES will work with community educators, who will play a key role in the capacity training and home visits during the year. These community educators will receive an intense two or three week course in early childhood development practices designed specifically for this pilot.

We will organize a course on monitoring and evaluation for early childhood development for staff of the Ministry of Health. The course will build on the experience of the pilot to demonstrate the advantages of randomized designs, show the usefulness of the different instruments, and share lessons learned from the evaluation of the MIFAMILIA programs. Contacts initiated in 2008 revealed that there is a demand for such a course, as experience with measurement of cognitive outcomes is limited but of interest for programs focused on nutrition and other aspects of early childhood. The course will take place in the first half of 2009.

ANTICIPATED OUTPUTS

We will produce several working papers and a first draft of a comprehensive report with results of medium-term quantitative impact evaluation, incorporating insights from qualitative fieldwork. Results will be presented in national policy fora and in national and international academic seminars, workshops and conferences. We have been asked to share lessons learned both in Nicaragua and for an international audience. The latter is a workshop on methods organized by the World Bank.

PATHWAYS FOR ENSURING ACCESS TO ASSETS: LAND REFORM AND BEYOND (LIBERIA AND UGANDA)

Principal Investigators

Jeanette Carter, University of Liberia

Cheryl Doss, Yale University, USA

Ruth Meinzen-Dick, International Food Policy Research Institute

Gorettie K.N. Nabanoga, Makerere University, Uganda

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. By collecting both community surveys and household and intrahousehold survey data from Liberia and Uganda, we can analyze these relationships and draw policy lessons. A unique feature of this data will be that we can examine women's access to assets in the context of particular community norms and practices.

Access to land plays an important role in alleviating rural poverty both directly and indirectly. Directly, land can be a source of income, insurance and collateral. Indirectly, land is a source of social status and bargaining power. Other assets may have similar roles. Yet little data is available to analyze the relationships among a full range of assets and their impact on wellbeing and livelihoods, especially by gender.

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 evolved during Liberia's history and that have been exacerbated by years of civil war. Uganda legislated land reform in 1998, but the implementation has been limited and uneven across the country. Both Liberia and Uganda exhibit a diversity of land tenure systems.

This project is unique in that most projects look at access to land in isolation, without considering the interrelationships of land with other assets. We focus on three sets of 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 OUTPUTS

- 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.
- Bibliographic database of relevant literature.

ACTIVITIES

We completed community surveys in Uganda and initiated them in Liberia, providing the foundation for developing the household/individual surveys, which will be implemented next year in both countries. A range of complementary activities were undertaken in both countries, emphasizing the policy dimensions, especially around women's access to assets.

The surveys collected community and household/individual level data on women's access to land and other assets. Community tenure profile protocols were drafted, and then field tested in both countries.

The Ugandan team conducted community tenure profiles in 11 communities in three districts. Using the key information survey instrument and the focus group protocol, community surveys began in November 2007 and ended in June 2008. The Ugandan team is analyzing the data and preparing an initial report of the findings on the community tenure profiles.

The Liberian team piloted the community surveys in one community. The instruments are being adapted to better meet the questions and concerns in Liberia. The modified instruments were implemented in the field in late 2008.

Research assistants based at Yale developed a bibliographic database, incorporating a variety of resources on the broader issues related to women's access to land and other assets. The database includes articles on women's access to land and assets generally; specific issues around land; news articles on disputes regarding land and assets; and dissertations on Liberia or Uganda with relevant sections. Both published and grey literature is included. Collaborators continue to add to the database.

During a team meeting in Uganda we drafted the intrahousehold survey, which will be collected this year. One of the PIs continues to be involved in developing the methodology and survey instruments for collecting individual level data. Her co-authored World Bank Policy Report is the basis for portions of the household/individual survey instrument to collect asset data.

Another of our PIs is involved in a SANREM CRSP project on decentralization and forest governance in four countries, including Uganda.

The gender analysis of that study, including the rights of women's and men's groups for forest resources, was presented at policy meetings.

A close collaborative relationship has been established between the project and the Governance Commission (formerly Government Reform Commission). One of our PIs has worked with the Governance Commission on land and property rights issues. In this capacity, she assisted the Commission in the identification of key land issues, supported the work of international consultants to the Commission, interacted with key stakeholders, and participated in consultations on land issues throughout Liberia. Six regional consultations were held that brought together men, women, and youth from the various districts and counties to discuss critical land issues.

The work with the Governance Commission contributed to the development of the Land and Environmental Policy and Action Matrix. A major accomplishment of the Governance Commission's work has been the drafting and vetting of an act establishing the Land Commission. That act has recently passed the Liberian legislature. It is anticipated that the Land Commission will be functioning by early 2009. We expect to continue working with the Land Commission, particularly in the coordination of research and in the implementation of our project, which will continue to feed into the development of policy.

In Liberia, we are collaborating with two other USAID-funded projects. The first is the Land Rights and Community Forestry Project, while the second is the Sustainable Tree Crops Project.

We participated in several Uganda Land Alliance land policy roundtables and have been directly involved with the work of the Governance Commission and the establishment of the Land Commission. This gives us a direct link into these key policymaking bodies.

FINDINGS

Uganda

In Luwero District, four villages were visited. The land tenure system is mainly *mailo*. There is some leasehold *mailo* land, public land (residue of *mailo*

that government took over after the colonial period), including wetlands, forests, woodlands, and leases on public land as well as on Kabaka's *mailo*.

In Kapchorwa District, three villages were visited. Land tenure is mostly customary, with some leasehold in urban areas. One of the villages is the Benet (forest-dwelling community on Mt Elgon), which was mostly public land. The community was being evicted from the forest and there was too much uncertainty to conduct community surveys.

In Kibale District, four villages were visited. The land tenure system was mainly *mailo*. The biggest problem is with Baganda absentee landlords who are working to reclaim the land from local tenants. Uganda Land Alliance has been involved in land battles in this district. In the 1970s, the government resettled landless Ugandans into Kibale districts. The Kanyabebe village has people living on resettlement scheme land. Some got leases/agreements-cum-certificates, but most have sold part of this land through informal sales agreements, recognized by government and not drawn up by traditional leaders. This land can also be inherited through sons. A Seventh-day Adventist church received public land, allows individuals to cultivate the land, and does not charge rent. It is mostly church members who use the land, but others can approach the church for use rights.

Local people seem not to distinguish the various types of land ownership. Most claim to have tenancy. Disputes occur when "owners" reclaim the land, evicting "tenants," who are supposed to be compensated; the processes of eviction are unclear.

While only citizens can own land in Uganda, land can be accessed through long-term leases from the government. The tenants say that instead of government dictating very low levels of rent, they would rather negotiate to buy the land.

Tenants have the soil but not the land. If they have long-term rights, they can build a house. Certain indigenous species belong to the land owner, but banana, coffee, food crops belong to the tenant that planted them. When short-term tenants leave, they forfeit anything that is there. The government wants the Buganda Kingdom, the largest landlord, to sell the land because it is not efficiently utilized.

Asset ownership is related to marital status. Customary marriages can include multiple wives.

Also, Muslim marriages, although under statutory law, can be polygamous. The general notion is a couple first has a customary marriage. Then the couple can "upgrade" to a church or state marriage, though if one wants to remain polygamous, one cannot "upgrade."

All children are treated equally before the law, regardless of marital status. Most men even with statutory marriages have other openly known partners. Yet if a man is married in church, only that widow receives part of the estate—the mothers of his other children only benefit through their children.

Married women in "secure" settings do not often accumulate assets outside of marriage, but women who are insecure in their marriage work to accumulate other assets because they are uncertain how long they will be able to access land through their husband. It was observed that more and more women are getting more independent and want their own assets such as land and livestock (pigs). If the husband's land is inherited, then the clan has a right to it and his wife will be less secure in her access to land in comparison with land that he purchases.

Few women buy land, but many rent land for crops. Women are acquiring more assets, especially livestock because of NGOs bringing in animals specifically to women. This can cause conflicts in the household.

In Kapchorwa, there were a few conflicts of inheritance and land sharing by women. When a man dies, his wife stays to cultivate in order to feed the children and she thus keeps access to the land. But tradition says that older children are responsible for the widow, so she will lose the land if the children choose to take it over. Clan members may also chase her away if she fails to remarry within the clan, but this is getting less common as women now know their rights and get alliances within the clan.

Men have to marry in order to get land from the clan. Men must bring land and a house to the marriage. It was reported that about 10% of the women from rich families may bring livestock to the marriage, and possibly even land. When women use their own money to purchase an asset during marriage, men will claim it, either individually or jointly. This may be resolved by giving the asset to children. Men do not want wives to bring land to the marriage because it has ties to her clan.

Liberia

People emphasized that their participation in matters pertaining to land and natural resource management was a high priority. Underlying themes conveyed by participants, both men and women, emphasize a strong sense of vulnerability in land rights and tenure security. This is combined with a strong sense of distrust and cynicism toward the government and the “Monrovia elites.”

Discussions revealed several areas in which women feel especially vulnerable. Educated women were clearly felt to have an advantage over uneducated women in the ability to access land and other assets through the statutory legal system. Under the statutory system in both rural and urban areas, women’s right to land are equal to men’s. When educated and with access to financial resources, women pursue these rights and own significant property around the country. Even they, however, feel vulnerable. Their rights may be overridden by male relatives when land is left to them by husbands or fathers. Women who have owned and developed property jointly with deceased husbands may find their claims to that property challenged by the husband’s male relatives.

Most women in rural communities continue to derive access to land primarily through their male relatives. Women find it difficult to plant tree crops for cash income and build houses on their own. As with those married under statutory law, women married under customary law who have developed property jointly with husbands may find access to it denied upon his death, especially if there are no male children. Divorced or widowed women without children, especially sons, are especially likely to be denied access to property. Young women also indicated that they are often excluded from getting land, in contrast to their brothers. Families tend to feel that when a woman marries, she will move elsewhere and are hence reluctant to grant her land. Further, young women are often not in legally-recognized relationships with the fathers of their children, increasing their vulnerability.

In some areas of the country, cultivable land is becoming scarce. For women whose major farming activity is the cultivation of food crops, this is a major problem. Throughout the country, men frequently attempt to establish ownership of land by planting tree crops such as rubber, cocoa, and coffee. This practice reduces the amount of land

available for food crop production. Land still available is often not accessible, especially by motor road, resulting in little or no access to markets. Lack of access to land and affordable male labor was reported by women to negatively affect their livelihoods and food security.

Some women indicated that they would prefer to obtain land under statutory law, which would give them clear ownership rights. They are constrained, however, by lack of resources to pursue what is seen as a cumbersome, expensive, and often discriminatory legal process. Among their recommendations is the institution of a process for obtaining deeded land that could be pursued locally and in a timely and affordable manner.

Issues pertaining to domestic law, including inheritance, divorce, and custody of children, were also raised by women. It appears that norms and behavior pertaining to domestic relations are changing rapidly, partially due to the disruptions of families during the civil war. Both customary and statutory law are viewed as often inadequate in addressing the conflicts and concerns.

Broad similarities across the country mask complex and nuanced patterns in different regions. In some areas, the strength of customary tenure that restricts the access of women is stronger, for example, Lofa, Bong, and the southeastern counties.

Throughout rural Liberia attitudes toward the value of land are changing. People recognize the economic value of land, which intensifies claims to land while also restricting access. This appears to underlie many current land disputes.

Rural people indicated a preference to settle disputes at the local level. In particular, they are skeptical of the judicial system, feeling disadvantaged against the wealthier and better-educated. A common concern was the disruptive influence of “Monrovia big shots,” such as the legislators who intervene in disputes. They also commented that the traditional local dispute resolution mechanisms are not working as in the past. In particular, they cited the tendency to permanently claim land planted in tree crops. Also of concern was the identification of “citizens” or members of communities. In some cases, members of families long absent from the community are returning and claiming rights to land. Both men and women expressed the need for information and education pertaining to land and property rights.

WHAT'S NEXT?

Uganda

The community surveys have been completed. The next step is to enter the data. The templates for data entry were developed at IFPRI and we demonstrated how to implement them during the project meeting in Kampala in August. Initial data analysis will take place this year and initial reports and policy briefs will be drafted.

In the household/individual level survey, we anticipate interviewing 35 households in each of the 12 communities in which we conducted the community surveys. We will interview up to four individuals in each household: the head, a wife (randomly selected if more than one is in the household), and two other adults. Questions will focus on individual level ownership of and access to assets. In addition, questions will be asked about how the assets were acquired, and we are exploring measures of both tenure security and household and marital security.

Training will include two MA students at Makerere. Both completed their undergraduate degrees in forestry, and one was involved with the implementation of the community surveys. We are planning a selection process to identify qualified students from Liberia to attend Makerere in August. We will seek to have a policy impact through work with the Uganda Land Alliance to ensure that our questions and findings can fit its needs and interests. We expect to lead one of its roundtable sessions held monthly with key stakeholders on land issues.

Liberia

The Liberia work has been slower because of the need to create much more of the research infrastructure at the university. In addition, our work on the project has overlapped considerably with the work of the Governance Commission and the broader discussions on land issues taking place in Liberia. A Land Commission was established by legislative act and will be operational in 2009.

We will implement the remaining community surveys, focusing on eight communities chosen from among six counties: Lofa, Nimba, Bong, Grand Bassa, Margibi, and Montserrado. These were selected to represent a range of tenure systems

across Liberia. The tenure systems include a mix of deeded land and land under customary ownership. In addition, within the twelve selected areas, we find smallholder farmers, private rubber plantations, foreign rubber plantations, forests, and former iron mines. Thus, we will gain important information about access to land as it intersects with a number of key policy issues.

The household survey will follow the same sampling procedures as in Uganda. The Uganda questionnaire will be modified to fit the Liberian situation. A national census was conducted in Liberia in March 2008 and is being processed. Lists of households in the selected communities will be available to form a sampling frame from which to select a random sample of households and to weight the sample for analysis. We will be in the field with questionnaires in the first half of 2009.

This year we will engage in a more formal and extensive process of identifying students to send for MA degrees. We will include them in the fieldwork for the household surveys.

The Governance Commission invited one of our PIs to provide a seminar on land policy to the newly formed Land Commission. Our research will feed directly into the priority work of the new commission, especially as it relates to customary tenure, community land rights, and the rights of women. We have concluded that this is a more useful way to impact policy than to initiate our own policy roundtable in Liberia at this time.

ANTICIPATED OUTPUTS

We will complete reports outlining the key findings from the community surveys in Uganda and Liberia. We will either write one academic paper comparing the two countries or write separate papers on each country. We will write policy briefs based on the community survey results in Uganda and Liberia. These will be disseminated to key stakeholders in each country. A meeting with members of the Liberian Land Commission will be held, and a presentation on our key findings will be made to the Uganda Land Alliance Roundtable. Finally, the project database on resources related to women's access to land and other assets will be made available to outside researchers.

AMA RESEARCH THEME:
SUSTAINABILITY AND USE OF NATURAL RESOURCES

IN DEVELOPING COUNTRIES HOUSEHOLDS DEPEND ON NATURAL RESOURCES both for income from forest products and for production. While use of resources is necessary for many people's livelihoods, there are not good incentives for sustainable use of the resources, and it is critically important to protect their quality over time. Understanding how households use their natural environment is key to developing policies that will 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 currently investigating policies that will protect both resources and those households that depend on their use.

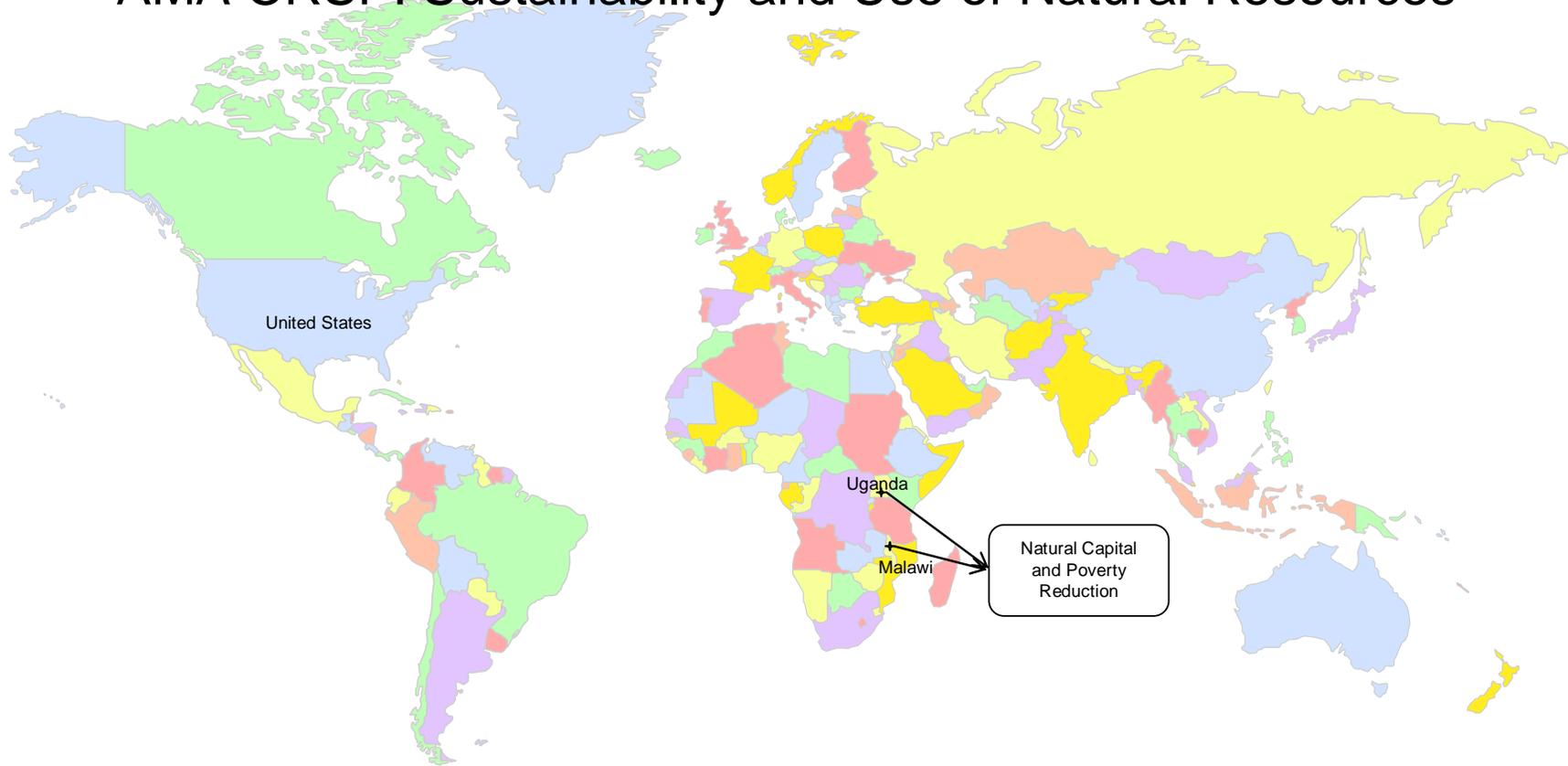
AMA PROJECTS

- Natural Capital and Poverty Reduction (Malawi and Uganda)

AMA BASIS BRIEFS

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. February 2008.

AMA CRSP: Sustainability and Use of Natural Resources



NATURAL CAPITAL AND POVERTY REDUCTION (MALAWI AND UGANDA)

Principal Investigators

Arild Angelsen, Norwegian University of Life Sciences

Monica Fisher, Center for International Forestry Research, Indonesia

Charles Jumbe, University of Malawi

Gerald Shively, Purdue University, USA

Dick Sserunkuuma, Makerere University, Uganda

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

THROUGHOUT THE DEVELOPING WORLD, COMMON-POOL RESOURCES such as forests, pastures, and water contribute to the wellbeing of rural populations. Field studies show that income from resource extraction accounts for up to half of total livelihood for rural households. The importance of resource extraction is amplified in the presence of risk, and such risk is expected to intensify as future climate change precipitates more extreme weather events, especially in marginal agricultural areas.

These observations motivate several questions that we are examining using a range of household and market survey data from Malawi, Uganda and elsewhere. These questions include: How important is the safety-net role of local natural resources for households experiencing idiosyncratic and covariate shocks? How does reliance on the commons for shock coping vary by household socioeconomic characteristics, market forces, and geographic factors? Does resource dependence merely represent an “employment of last resort,” or can natural capital be leveraged to lift rural households out of poverty? To what degree are opportunities for resource-led poverty alleviation facilitated or constrained by greater degrees of market integration?

Additional outputs

Angelsen, A. 2008. “Seeing Both the Forest and the Trees in REDD.” Forthcoming in *International Forestry Review*.

Babigumira, R., A. Angelsen and D. Müller. 2007. “An Integrated Socio-economic Study of Deforestation in Western Uganda, 1990-2000.” In *Land use Change: Science, Policy and Management*, edited by R. Aspinall and M. Hill. New York: CRC Press (Taylor and Francis).

Fisher, M. and G. Shively. 2007. “Improved Agricultural Technology and Tropical Forest Pressure: The Case of Malawi’s Starter Pack Scheme.” *Journal of Agricultural and Resource Economics* **32**(2): 349-362.

Jumbe C.B.L. and A. Angelsen. 2007. “Has Forest Co-management in Malawi Benefited the Poor?” In *Political Institutions and Development: Failed Expectations and Renewed Hopes*, pp. 171-199. Global Development Network Series, Edward Elgar, Cheltenham, UK.

Jumbe, C. and A. Angelsen. 2007. “Forest Dependence and Participation in CPR Management: Empirical Evidence from Forest Co-management in Malawi.” *Ecological Economics* **62**(3-4): 661-672.

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.

Rios, A., W. Masters and G. Shively. 2008. “Linkages between Market Participation and Productivity: Results from a Multi-Country Farm Household Sample.” American Agricultural Economics Association Annual Meeting, Orlando, 27-29 July.

Tran, N. A., G.E. Shively and P.V. Preckel. “A New Method for Detecting Outliers in DEA.” Forthcoming in *Applied Economics Letters*.

Weber, B., A. Marré, M. Fisher, R. Gibbs, and J. Cromartie. 2007. “Education’s Effect on Poverty: The Role of Migration.” *Review of Agricultural Economics* **29**(3): 437-445.

ACTIVITIES

We focused on ramping-up research, training, and outreach activities in Malawi and Uganda. We also began a third research trajectory of cross-cutting issues, comparative studies, and analysis of a broader set of data than those for Malawi and Uganda only.

UGANDA

Fieldwork included two household surveys, one focusing on charcoal production (600 households) in the districts of Hoima, Masindi, and Nakasongola and a second focusing on timber production (180 households) in Kabale and Chamba. An extensive market value chain survey was completed for the charcoal trade between producing villages and the Kampala retail market (273 households). These surveys helped us examine factors influencing household dependence on natural resources and how this reliance varies with levels of income or wealth, gender, and market conditions. Also we can look at the impacts on poverty status of households and natural resource conditions. Data entry and data cleaning for all three surveys began, and two data sets are now available in electronic form.

Two of the surveys are designed to provide a “stump to stove” analysis of charcoal production in three districts in western Uganda. The aim is to better understand who produces charcoal and how charcoal production fits into the overall livelihood and risk-management strategies of rural households and communities. The districts chosen for the surveys differ in their forms of forest-related governance.

In 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 resource revenues along the supply chain to examine issues related to market access, market organization and market power. Through this effort we anticipate being able to describe how market structure and performance influence household welfare and risk exposure, which should be critical for the design of policies related to this sector.

Our third survey covered 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. 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.

Training was extensive and focused on strengthening research capacity at Makerere University. Two related M.S. degrees are underway in the Department of Economics and Resource Management at the Norwegian University of Life Sciences. The students participated in week-long research training at Makerere and the fieldwork. The theses will focus on poverty dynamics and the role of forests.

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 is a quarterly income questionnaire. We separately interviewed husbands and wives in the income recording so we could improve 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.

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 (climate surfaces, land cover, etc.) were acquired and satellite imagery interpreted to enable development of a geodatabase that will be merged with the household-level data.

A second study was designed, with a focus on the nexus among maize, tobacco and forest pressure. Observations suggest considerable leakage of subsidized fertilizer from maize to tobacco production and significant associated draw-down of timber stocks for producing flue-cured tobacco. This 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 began training our first M.S. degree Malawian student. We also established a working relationship with the Director of Forests in Malawi, who provided input on plans for data collection in 2009. We are involved in a number of expert meetings, including stakeholder consultations and five international conferences related to biofuels.

CROSS-CUTTING ACTIVITIES

We completed data collection is now complete for Malawi and Uganda. Our work is part of CIFOR's Poverty Environment Network (PEN). One of our project's PIs is responsible for overall coordination of this project. We focused on establishing the database, preliminary analysis, and work on a methods book and several papers.

This aspect of our project is synergistic with other activities. The first and primary synergy is PEN, which involves collection in more than 25 countries of environmental and socioeconomic data using a consistent survey instruments and implementation. These surveys include a detailed recording on a quarterly basis of all income sources, including all uses of forests. Further, the PEN global data set, because it contains information from more than 200

throughout the developing world, will eventually 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



Fuelwood transporters outside Lilongwe, Malawi

Photo by Gerald Shively

being used to study the role of natural insurance in those countries.

The second project synergy is with a National Science Foundation (NSF)-funded project. The NSF project focuses on examining 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 data set 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, most of which is likely to be undertaken in central and western regions of the country.

The third synergy is that several MS students studying at the Norwegian University of Life Sciences collaborated on fieldwork for their theses in Uganda. They chose thesis topics that feed into the project goal of examining the role of environmental income in risk management, asset accumulation, and poverty reduction.

The fourth synergy is with an ongoing research project funded by the Sustainable Agriculture and

Natural Resource Management (SANREM) CRSP. This activity is a cross-country study of poverty and vulnerability to climate change. Through the SANREM CRSP, USAID provides support for a Ph.D. student at Purdue University. The primary goal of this work is to better understand the non-linear relationship between income growth and reductions in household and national-level vulnerability to climate change. The AMA strand of this work provides an opportunity to study climate vulnerability at a finer level of granularity in the context of Malawi and Uganda, through the use of our household surveys.

FINDINGS

The clearest impacts achieved thus far are associated with improving research capacity at Makerere University through the week-long research training for students, staff, and enumerators. We consider the training in ethical conduct of research an especially noteworthy and novel contribution in this area.

Preliminary research findings indicate that forest dependence (measured by share of forest income in total income) varies enormously across sites. More insight into the role of forest income can be found by examining the poverty profile of forest income. This can be measured as a ratio, constructed with the share of forest income of the poorest 20% of the population in the numerator and the share for the richest 20% of the population in the denominator. This poverty profile ratio tends to be inversely correlated with income and appears to be much higher than hypothesised (up to a ratio of 5 in some settings). Ongoing work seeks to explain the observed patterns.

In Uganda, initial evidence from the surveys suggest that extraction patterns and rates differ

markedly by district, in ways 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. This highly heterogeneous charcoal production ranges from small-scale clandestine production to large-scale production in which large land holders establish livestock ranches and contract with urban charcoal traders to clear land, often working in crews of more than 100.

In other situations, small-scale pastoralists trying to establish pastures may sell trees to charcoal burners who provide their own labor. These patterns suggest a more complex dynamic relationship between charcoal producers and agriculturalists than initially imagined. In some cases, it appears that agriculture and livestock production is a precipitating factor in forest loss; in other cases, forest degradation occurs as an independent outcome of household exposure to idiosyncratic risk.

For example, initial findings suggest that in some locations the relative peace in northern Uganda and the repatriation of landless Sudanese refugees who were involved in charcoal production may be leading to a reduction in charcoal production, suggesting that political risks, and not just economic forces are at play in the charcoal economy of Uganda.

Profit margins in charcoal production, transport and wholesaling appear to vary widely across locations, and may be correlated with patterns of local 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 point-in-time price variability for charcoal far exceeds that observed for many agricultural products.

WHAT'S NEXT?

UGANDA

No further data collection is expected unless gaps in knowledge are identified that require revisiting survey areas or sampling new ones. Data entry and analysis will continue. Analysis of data from the value chain surveys will allow us to decompose resource rents along the supply chain and examine issues related to market organization and market power, and how market structure and performance influence household welfare and risk exposure. We anticipate a draft analysis paper from the sawn wood surveys to be complete this year.

We will conduct a short-term research workshop if we believe we have sufficient research findings to justify this activity in 2009. Otherwise, we will continue to engage stakeholders and seek to build our research and policy networks in Uganda and elsewhere, so as to establish a conduit through which to disseminate findings in subsequent years of the project.

MALAWI

We now have eight rounds of survey data. Data processing will consume much of 2009, with some analysis begun late in the year. The main hypotheses center on the role of supplementary forest income in the risk-management strategies of smallholders and the role of health and weather shocks in conditioning forest use.

OUTREACH

We will continue to extend our research and policy network, focusing special attention on outreach to the USAID missions in Malawi and Uganda. Several project members anticipate participating in

the 2009 meeting of the International Association of Agricultural Economics in Beijing. Our annual project meeting will be held in conjunction with the annual meeting of CIFOR's Poverty and Environment Network, providing significant scope to interact with the larger development policy community. We anticipate production and local dissemination of at least two policy briefs (one each for Malawi and Uganda) in 2009.

ANTICIPATED OUTPUTS

Several papers are in preparation. A cross-cutting paper entitled "Vulnerability and Climate Change" is in draft form and will be made available as a BASIS working paper. A core project paper entitled "Concept Notes on Vulnerability;" descriptive papers on the charcoal value chain and migrant timber labor in Uganda, and a concept paper on the linkages among maize, tobacco and forests in Malawi are also planned. We anticipate moving many of these concept and working papers into more formal academic channels.

We will generate policy briefs on the above topics for distribution in the host countries. Of immediate interest is a policy brief on "maize, tobacco and forests in Malawi" in response to demand from stakeholders in Malawi's Ministry of Forests.

We will conduct a week-long research training workshop in Malawi in June 2009, the format of which will closely follow the format of the training workshop conducted in Uganda in 2008. Training will be on specific modules on research ethics, research design, and fieldwork methods. Once the initial wave of research findings are available from Uganda we expect to hold a policy workshop in Kampala.