



FEED ^{THE} FUTURE

The U.S. Government's Global Hunger & Food Security Initiative



ANNUAL REPORT

2016

FEED THE FUTURE INNOVATION LAB
FOR ASSETS & MARKET ACCESS

University of California, Davis



INNOVATION LAB FOR
**ASSETS &
MARKET ACCESS**

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2016 Assets & Market Access Innovation Lab Annual Report

EXECUTIVE SUMMARY: Accessible and Actionable Innovations

In 2016, the Assets & Market Access Innovation Lab has continued its pursuit of rigorous, policy-relevant research designed to reduce poverty and promote inclusive agricultural growth. In previous years, we have emphasized the strength of our portfolio, the rigors of our research, and preliminary information. This year, however, we would like to draw focus on our extensive work to ensure the research we support is **accessible** and **actionable**.

In other words, we want to make sure the research and lessons learned make it to the hands of those who can implement innovative interventions. We're proud to say that, over the past year, we've made great strides in this area, and prouder still to see that the **opportunities are continuing to grow**.

In June 2016, we held a DC-based two-day evidence summit in partnership with the National Bureau of Economic Research (NBER) on "[the Economics of Asset Dynamics and Poverty Traps](#)." This workshop was designed to bring together empirical researchers with modelers working in the area of economic growth and poverty reduction, concluding with a session specifically covering policy implications and a roundtable with representatives from The World Bank and USAID. We look forward to more synthetic evidence summits in the near future.



Perhaps even more important, however, are our interactions in small meetings, briefings, and presentations with **host country NGOs and policymakers that can be huge change-makers**. Over the past year, AMA has co-sponsored an [index insurance event in Ethiopia](#), held a series of meetings with officials from the Government of Nepal on [strengthening the insurance market](#), and held countless other meetings with officials and stakeholder partners.

In addition, we have been planning events that vary from a [local event on the results of an experiment in Haiti](#) to a globally focused event in Washington DC that focuses on [bridging the gap](#) between technological potential and the realities on the farm of smallholder farmers in the developing world.

Over the next year, as the Assets & Market Access Innovation Lab enters the last year of this funding cycle, we look forward to even more results and, with them, increased outreach and dissemination activities.

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MAP AND LIST OF COUNTRIES WITH ACTIVITIES

Location of Activities

The Assets & Market Access Innovation Lab strongly encouraged activities to be performed in Feed the Future focus countries, and penalized proposals that were not for research in these activities. This system was intended to balance the demands of identifying the strongest proposals with a desire to coordinate with Feed the Future's geographic priorities. Proposals were selected that were able to clearly demonstrate the contribution to mission and Feed the Future priorities. We anticipate that most, if not all, of our projects will have policy implications across their respective regions, if not globally.



List of Countries

North & Central America:

Dominican Republic, Haiti,
Mexico

Africa: Burkina Faso,
Ethiopia, Ghana, Kenya, Malawi,
Mozambique, Senegal, Tanzania,
Uganda

Asia: Bangladesh, India, Nepal



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Advisory Committees

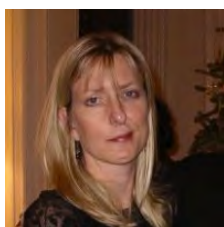


Role of the Board of Directors

Board members are selected in consultation with our USAID project officer, and with an eye toward obtaining disciplinary and regional balance, as well as developing country representation. The Board, per our original proposal to serve as management entity: *“will be responsible for selecting a full portfolio that allows for topical and regional balance, and ensures that all funding goals are met. The Board will pay close attention to the research strategy for Feed the Future, and work with ME staff to ensure that the selected projects will help USAID and the Bureau of Food Security reach the goals of FtF.”*

The Board also serves as an advisory group to AMA Innovation Lab management as necessary, and to help resolve problems should they arise. The Board also receives support via external evaluations by subject matter experts as necessary, to avoid placing the full burden of the technical review on Board members.

AMA Innovation Lab Board of Directors



Lena Heron
Senior Rural Development Advisor
United States Agency for International
Development



Craig McIntosh
Professor, School of Global Policy and Strategy
Co-Director, Policy Design and Evaluation Lab
University of California San Diego



Jolyne Sanjak
Chief Program Officer
Landesa



David Ameyaw
Chief Executive Officer
International Centre for Evaluation and
Development (ICED)

Technical Committee

The Technical Committee is comprised of all the principal investigators for all Assets & Market Access Innovation Lab activities. This committee offers the opportunity for peer review of all projects.

The Technical Committee meets annually to present their progress and/or results, as appropriate to their project. They discuss methodologies and get feedback and suggestions for how to overcome challenges or for the next phase of their research. These meetings are also an excellent opportunity for researchers to identify potential synergies between their projects. These meetings also serve as an opportunity to plan joint outreach activities, and to discuss how best to disseminate the results and policy implications of their research.

This past meeting of the Technical Committee was held at the University of California Berkeley on October 29-30, 2015. The next meeting will take place November 4-5 at George Washington University in Washington, DC.

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PROGRAM ACTIVITIES AND HIGHLIGHTS

Program Activities

As we are now entering our final year of this iteration of the Assets & Market Access Innovation Lab, our activities reflect the transition from ongoing project management to activities focused on the transition, including dissemination activities, subaward contract close-outs, and preparations for the independent external evaluation and re-bid to serve again as management entity.

In addition, we are continuing implementation in earnest of our two previously awarded associate awards: one for enabling action on index insurance, and the other to evaluate the impact of interlinked financial and agricultural technologies (index insurance and drought tolerant maize varieties) in Mozambique and Tanzania.

Finally, the past year has seen significant advances in our efforts to disseminate what our research projects have learned to date to relevant stakeholders. More information on these efforts is in the box below.

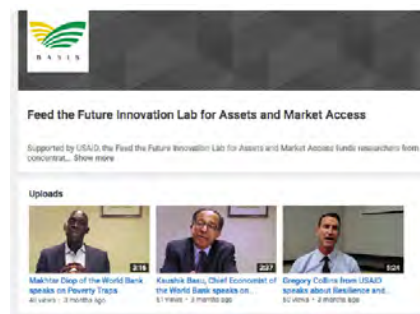
New Outreach & Dissemination Activities

Since our last reporting, the Assets & Market Access Innovation Lab has initiated a suite of new communications materials to assist with outreach and dissemination. In recognition that technology and our modern workplaces allow people to access information in a wide variety of ways, we now complement our traditional research briefs with new outreach and dissemination tactics.

We highlight some of the new activities below:

- We have created a new publication series called “Spotlights” intended to share information about research projects that are interesting and relevant, but perhaps not research results in a traditional sense. To date, seven “Spotlights” have been written and distributed, with more in the works. *(top right image)*
- We are in the process of creating a “Thumbnail” for each project that provides a brief summary of the context, research, and intended impacts, along with basic award information including funding, location, focus commodity, etc. *(top right image)*
- We are assembling short video interviews with researchers and experts to share the research they are doing and why it is important in a more accessible, non-technical, and personal way. We created a YouTube channel to host these videos. *(middle right image)*
- We launched the first foray of the AMA Innovation Lab into the realm of social media with a @AMAIInnovLab Twitter handle. *(bottom right image)*

Over the next year, we look forward to continuing to build on these resources and to **develop new tactics and strategies to effectively communicate what we’ve learned and the implications for program and policy development.**



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Program Highlights

New Associate Award to Study Interventions for Resilience

This past year the AMA Innovation Lab team assembled and submitted a proposal for an associate award designed to evaluate the effectiveness of a series of interventions designed to **enhance the resilience of vulnerable populations**. Funded from the DC office of USAID, projects under this associate award will evaluate interventions actually being implemented in several different countries, including activities of USAID missions.

Activities under this award so far have been extremely preliminary, as the award start date was 9/30/2016. We look forward to initiating activities in the next year.

Interventions Being Put to the Test in the Field

When conducting impact evaluations that test conditional interventions that are triggered in the event of a negative shock (like a drought or a flood), it can be problematic. Often these research studies are only 2-4 years in length,



and the observable shock only occurs, on average, in five or more years. Obviously, for the well-being of the local populations, we do not want a disaster to strike, but in order to observe the effectiveness of the intervention, it is extremely helpful to observe the shock and whether the intervention actually impacted the target population as intended.

For several of our research projects evaluating the effectiveness of interventions designed to help vulnerable populations cope with negative shocks, these shocks have been triggered in the past year, **allowing researchers to more completely assess the impacts of the interventions and their potential to enhance the resilience of these vulnerable populations**. While we are still waiting for analysis of the data for full impacts, these events increase the probability that these research projects will be able to offer important information on these interventions with policy recommendations.

New Impact Evaluation of Mission-Supported OVC Program

Mozambique's USAID mission requested AMA Innovation Lab support for a **rigorous impact evaluation of a mission-supported package of interventions for Orphans and Vulnerable Children (OVC)**. Through an AMA Innovation Researcher - Dean Yang, at the University of Michigan - the evaluation activities started this past year with the start of field operations. The research team expects the baseline survey will be completed in early October 2016. The AMA Innovation Lab is excited to work with the USAID mission to generate evidence around programming for these highly vulnerable populations.

OTHER HIGHLIGHTS

RECOGNITION OF ACHIEVEMENTS

Director Michael Carter and his colleagues at Cornell University (Chris Barrett) and ILRI (Andrew Mude) will be awarded the "BIFAD Award for Scientific Excellence in a Feed the Future Innovation Lab" for their outstanding contributions to understanding poverty traps. The award will be given at the World Food Prize events in Des Moines in October 2016.

CLIENT VALUE

The AMA Innovation Lab has for several years been urging those interested in index insurance to increase emphasis on the value of the insurance product to the client - being attentive to if, by buying a contract, the purchaser is at least not worse off. This past year saw gains in the efforts to increase the dialogue on these issues through the *Global Action Network*, including planning for a client value assessment tool (to be released in 2017).

CONFERENCE ON ASSET ACCUMULATION & POVERTY TRAPS

An AMA Innovation Lab/NBER co-hosted event in June 2016 brought together researchers to discuss our understanding of poverty trap mechanisms, to try to integrate theories to date and to extend our knowledge further. In addition, this conference developed the implications of poverty trap mechanisms for policy and program design.

CAPACITY BUILDING FOR INDEX INSURANCE PARTNERS

As part of our associate award designed to advance index insurance, our work with the ILO has expanded to try to overcome the challenges to successful and effective scaling of index insurance as a result of lack of strategic involvement of governments in developing countries. This includes a peer-to-peer knowledge sharing network of developing country governments.

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KEY ACCOMPLISHMENTS

Outreach & Dissemination

In 2016, the Assets and Market Access Innovation Lab has made significant progress disseminating results and lessons learned to stakeholders. Through our outreach and dissemination activities, the Innovation Lab hopes to increase the knowledge about these issues and interventions, build the capacity of implementers to responsibly design and implement these types of interventions, and encourage scale-up for those interventions with high potential for positive welfare impacts.

Efforts to disseminate evidence for proven interventions to build resilience and assets for food security have led to the following accomplishments:

EVENTS

- *Promoting Index Insurance in Ethiopia* workshop in Ethiopia had over 50 registered participants that discussed what needed to be done to scale index insurance to create impact.
- A conference on the *Economics of Asset Dynamics and Poverty Traps* brought together economic experts to discuss what has been done and what is still needed. A conference volume will be released in 2017.

PUBLICATIONS

- AMA Innovation Lab highlighted in [Feed the Future blog](#).
- AMA Innovation Lab project highlighted in [June 2016 Feed the Future Newsletter](#).
- Many other [internal publications](#) distilling important knowledge generated by AMA Innovation Lab researchers.

AWARDS

- AMA Innovation Lab researcher, Andrew Mude, wins [Norman Borlaug Award for Field Research and Application](#).
- AMA Innovation Lab research team wins [BIFAD Award for Scientific Excellence](#)

The AMA Innovation Lab looks forward to continuing these types of outreach efforts - and more - in 2017.

Promoting the Responsible Scaling of Index Insurance

The AMA Innovation Lab has been at the forefront of evidence generation on index insurance for many years, but through the Advancing Index Insurance Associate Award, it is now creating practical tools for the responsible scaling of index insurance.

The AMA Innovation Lab, with project partners around the world, has created first drafts of **policy-relevant tools** for index insurance, including quality assessments tools for index insurance, guidelines for bundling of index insurance with other value-added interventions, and guidelines on consumer education on index insurance. In 2017, we will finalize these tools with partners and launch them through training activities for stakeholders poised to scale insurance in their own countries.



Making Innovations Available to Smallholder Farmers

EMERGENCY LOANS IN BANGLADESH

AMA-supported UC Berkeley researchers partnered with BRAC to pilot **Emergency Loans** across 200 branches, making the risk management tool available to 30,000 BRAC clients. This year, 350 emergency loans were issued in eight branches where the flood triggered loan availability.

DIGITAL TRADING PLATFORM IN UGANDA

Kudu, the **digital trading platform** being piloted by AMA researchers at UC San Diego, connects buyers and sellers. By August 2016, the project has received over 2,500 asks and 2,800 bids through the system.

INCENTIVES FOR CONSERVATION AGRICULTURE IN MALAWI

Agglomeration payments to encourage conservation agriculture in Malawi have doubled participation in the scheme from 1,450 in year 1 to 2,870 in year 2. Impact analysis is ongoing, but more farmers are participating in this improved set of practices.

INDEX INSURANCE IN GHANA

AMA-supported researchers from Yale are evaluating an **index insurance** intervention in Ghana. In 2015, over 1,000 farmers bought the insurance - and payouts were triggered in most communities. Sales increased to over 1,800 in 2016, with changes in response to farmer feedback to improve the product.

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RESEARCH PROGRAM OVERVIEW & STRUCTURE

Program Overview

The University of California Davis Management Entity manages the Feed the Future Assets and Market Access Innovation Lab according to the following principles, as outlined in the original proposal to USAID from the initial award in 2011.



From the Proposal

1. Open competition to select the highest quality research projects to create a portfolio that implements the vision of the BASIS AMA Innovation Lab;
2. Engage USAID Missions with dedicated outreach to identify innovative pilot activities that complement their strategic goals and programming under Feed the Future;
3. Project Monitoring to ensure sound technical progress, achievement of impact, and contribution to program and agency goals;
4. Commitment to Innovative, High Quality Research that generates policy relevant results, with lessons drawn out for maximum utility by policymakers and programmers; and,
5. World-Class Leadership by an established faculty member with the global reputation, knowledge, and commitment needed to mobilize and mold the highest quality research program.

Management Structure

Management Entity

The Assets and Market Access Innovation Lab Management Entity currently includes of 6 individuals. The office includes a 50% Director, full-time Assistant Director, 60% Financial Analyst, full-time Strategic Communications Manager, 60% Communications and Outreach Specialist and a Management & Outreach Student Assistant (15 hours/week).

The *Director* takes primary responsibility for the technical oversight of the projects. He closely reviews all proposals and work plans of the selected projects for technical soundness, and continually reviews the projects through both Technical Committee meetings and direct communication with researchers throughout the life of the project.



Dr. Michael Carter
Director
Assets and Market Access Innovation Lab

Management Structure (cont.)

The *Assistant Director*, Tara Steinmetz, is responsible for the day-to-day operations of the AMA Innovation Lab. She is responsible for budget monitoring and providing the Director with necessary information to make funding and other management decisions. She ensures that all projects meet reporting requirements, and are making progress toward specific benchmarks that were approved at the beginning of the project. This is done to make sure that each project continues to make progress towards demonstrable impact.



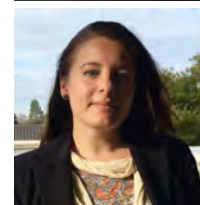
The *Financial Analyst*, Christine Helsing, provides contracts and grants administration, including taking the lead on managing outgoing subcontracts, modifying existing subcontracts, and working with University of California Davis offices on their oversight. She is also responsible for invoice approval and tracking of subcontract spending.



The *Strategic Communications Coordinator* develops and implements a strategic communications plan for international development, agricultural, economics, and related stakeholders. He establishes and maintains connections with media, key stakeholders, researchers, news service groups and related agencies. The Strategic Communications Coordinator works with the Communications & Outreach Specialist to ensure outreach to lay audiences is appropriately aligned with the strategic communications plan.



The *Communications and Outreach Specialist*, Sophie Javers, focuses on developing and creating a suite of easily accessible, digestible dissemination pieces for lay audiences. This may include design and implementation of events, comprehensive interviews, coordination and edit of field reports, engagement in blogs, and other content development in coordination with the strategic communications plan and in alignment with the activities of the Strategic Communications Coordinator.



The *Management and Outreach Student Assistant* works approximately 15 hours per week, and helps with a variety of tasks as needed across the organization.

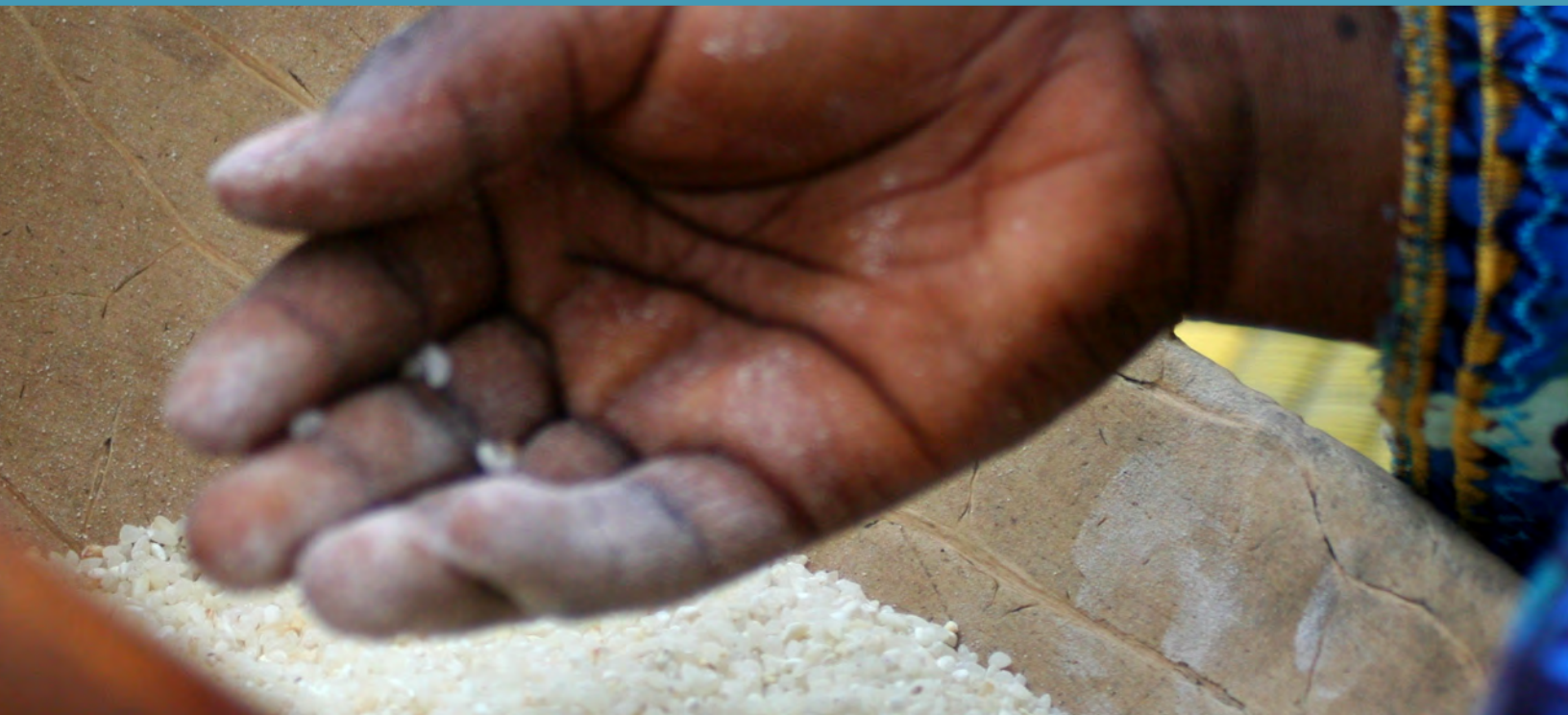
Board of Directors

The AMA Innovation Lab also has a standing Board of Directors, which consists of four members recognized for their expertise in areas relevant to the work of the AMA Innovation Lab, including international development, economics, sociology, and other development-related social science disciplines. The Board includes Craig McIntosh (University of California San Diego), Jolyne Sanjak (Landesa), and David Ameyaw (Director; Strategy, Monitoring and Evaluation Unit, Alliance for a Green Revolution in Africa). The Board also includes the AMA Innovation Lab's AOR, Lena Heron, to ensure that the direction of research program remains compatible with the goals of Feed the Future.

Since the funding start of the AMA Innovation Lab, the Board has met via telephone conference (to accommodate geographic diversity of board members) and has also had important email correspondence to review, advise and consent on management matters. The telephone meetings were to select research projects for the AMA Innovation Lab project portfolio. With the advice of an ad hoc proposal evaluation panel of external experts, the board selected a portfolio of research projects that allow for topical and regional balance. The board also focused on identifying proposals that had clear policy relevance and had the potential to identify recommendations that can increase development impact in the areas of focus.

Technical Committee

The Technical Committee is comprised of the U.S. and host country PI for all AMA Innovation Lab activities. This committee is responsible for peer review of all projects, including annual review of work plans. The committee meets annually to present most recent findings, discuss methodologies, and get feedback and suggestions on the next phases of their research. These committee meetings are an excellent opportunity for researchers to network, discuss ongoing work, provide feedback and lessons learned, and identify opportunities for collaboration or continued information sharing.



RESEARCH THEME I

INDEX INSURANCE & RISK MANAGEMENT

Finding ways to deal with risk and thus reduce poverty has long been a goal of development policy. The AMA Innovation Lab and partners are rigorously testing the hypothesis that by removing correlated risk from smallholder agriculture and pastoral systems we can reduce poverty and deepen markets.

Emily Breza, Columbia University, "A Quasi-Experimental 'Post-Mortem' Study of a Discontinued insurance product in Haiti"

Michael Carter, University of California Davis, "Agricultural Insurance in Nepal"

Elisabeth Sadoulet, University of California Berkeley, "Building Resilience and Assets for Food Security in Bangladesh."

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PROJECT REPORT: A Quasi-Experimental “Post-Mortem” Study of a Discontinued Insurance Product in Haiti

This research project takes advantage of a unique learning opportunity to investigate the failure of an integrated credit-hybrid insurance product retrospectively via a “post-mortem” investigation.

Following the [January 2010 earthquake](#) that devastated Haiti, [Fonkoze](#), a microfinance institution, instituted a mandatory natural disaster insurance policy covering its 60,000 female borrowers across all ten departments of Haiti. The product was designed to reduce the MFI’s portfolio to risk (against widespread loan repayment default in case of large-scale disasters) while supporting borrower advancement in its graduation model.

The hybrid index- and indemnity-based policy covered the institution against rainfall, wind and seismic shocks based on sharp parametric thresholds in 15 geographic regions, and protected the property (merchandise and house) of all 60,000 borrowers through indemnity-based coverage. An important innovation in product design was training one peer-elected borrower per credit center to process and verify their peer’s claims during credit meetings, thereby leveraging the MFI’s machinery for scalable, low cost loss adjustment using village-level, private information (with backup from staff auditing teams). However, the indemnity-based component of the policy covering borrowers was discontinued in late October 2012 (the index-based component covering the institution continues).

Researchers aim to conduct a quasi-experimental study of the discontinued product using a variety of identification strategies and data sources. They intend to focus on two sources of problems that are potentially interrelated: basis risk in the parametric-based insurance arm and more hazard in the peer loss adjustment- and indemnity-based insurance arm. They will examine what went wrong with the product and why, in order to generate recommendations for improved models.



Collaborations

Emily Breza (*Assistant Professor, Columbia University, Graduate School of Business*)

Daniel Osgood (*Lead Scientist, Financial Instruments Sector Team, Associate Research Scientist in Economic Modeling and Climate, International Research Institute for Climate and Society, Columbia University*)

Bénédiq Paul (*Professor, Economics Department, Quisqueya University and State University of Haiti*)

Carine Roenen (*Executive Director, Fonkoze*)

Project Outputs

Drafted paper with working title “Credit demand and collusion among risk sharing groups under formal insurance”, written by Aaron Baum as part of his PhD dissertation.

Oral presentation at the Sustainable Development Research Symposium, Columbia University (2016). Agenda available [online](#).

For more information on this project, please see our [website](#).

Achievements

In conducting this research, the team administered approximately 1,500 surveys across 10 bank branches and 50 village-level credit centers. The survey was designed to ask surveyed individuals about their experience with the insurance product, as well as about household characteristics including exact location, consumption, assets, business, etc.

In addition, the research team analyzed existing data, including administrative records, insurance, and private survey data. Satellite data products were matched to 1,500 locations. These datasets include flooding, rainfall, hurricane wind speed, temperature, topography and soil data. The research team held discussions with various people

involved in the project, including Principal Investigators, consultants, and other partners.

Finally, to disseminate results and to discuss next steps, the research team created presentations outlining their preliminary results, as well as drafted a working paper. Researchers will continue to work on analysis and interpretation of the data in the next year, as well as working to improve dissemination efforts and more clearly engage in specifying policy implications, recommendations, and promoting the next steps for this area of research, both specifically in Haiti and more generally.

Capacity Building

This project was limited in scope and budget, and as a result had less of a capacity building component than many AMA Innovation Lab research projects.

The research project did, however, play a significant role in the PhD education of [Aaron Isaac Baum](#), who wrote a paper on this research as part of his PhD dissertation.

Dr. Baum has since graduated from Columbia University and is Staff Economist and Assistant Professor at the Icahn School of Medicine at Mount Sinai, as part of the Arnhold Institute for Global Health.



Lessons Learned

This project created something of a natural experiment for the research team, as microfinance borrowers across rural Haiti received a quasi-random amount of insurance benefit after catastrophic hurricanes with claims done by a peer.

Researchers observed that the insurance policy strengthened formal credit markets by reducing attrition. On the other hand, formal insurance appears to have weakened informal risk sharing networks. There was substantially reduced informal borrowing three years later, and the duration of informal risk sharing relationships were reduced. This may be interpreted as an indication that the insurance policy strengthened formal credit markets at the cost of weakening informal risk sharing networks.

There are still opportunities for continued field research in this area. Fonkoze's efforts in Haiti indicates that they still may have interest in offering alternative risk mitigation products in the country.

As a result of the preliminary analysis, the researchers indicate that microfinance should consider offering or mandating hybrid insurance policies, as they are more durable and longer lending relationships. More generally, this research seems to indicate that microfinance institutions can function as a platform for delivery of additional products or interventions beyond credit by using its networked, community-based infrastructure to reach rural, vulnerable populations.

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PROJECT REPORT: Assessing the Feasibility of Agricultural Index Insurance for Maize Farmers in the Terai Region of Nepal

AMA Innovation Lab researchers and USAID mission in Nepal are working together to assess the potential for index insurance to help farmers manage risk and to promote agricultural growth.

Farming is, by its very nature, rife with risk. The main source of risk in developing countries is often yield uncertainty: farmers cannot perfectly predict yields at the time they plant in large part due to variation in weather. Such risk is known to have two main negative impacts. First, after a disaster (the ex post effects), if a disaster occurs, farmers may have to sell off assets, reduce consumption, or rely on foreign aid to survive, and may fall into a poverty trap. Second, in anticipation of these disasters occurring (ex-ante effects), risk-averse farmers acknowledge and respond to the known risks by underinvesting in their farms, often at the cost of expected returns.

Given these negative impacts, a risk transfer tool - like index insurance - can encourage investment and prevent descents into poverty. However, insurance markets remain underdeveloped in developing countries, including Nepal. By linking payouts to predicted average losses rather than individual loss claims, this administrative costs are dramatically reduced and the insurance is affordable for farmers. For this to work, however, the quality of the correlation between the index used and the individual yields of farmers is absolutely crucial to be of value to the farmer and for the success of the insurance.

Assets & Market Access Innovation Lab researchers have worked in cooperation with USAID mission in Nepal to assess the potential for index insurance in the country, across agricultural production sectors and across different indices to determine whether there is a feasible solution to help farmers in Nepal manage risk for increased resilience and to promote agricultural growth.



Collaborations

Michael Carter

Professor, Agricultural and Resource Economics
University of California, Davis

Jisang Yu

Assistant Professor, Department of Agricultural
Economics
Kansas State University

This research was conducted in collaboration with the **USAID mission** in Nepal.

Project Outputs

This project has generated a series of progress reports which are publicly available on the AMA Innovation Lab website, including a [work plan](#), a [field trip report](#) from the initial visit, and a [final report](#).

In addition, the work in Nepal inspired an innovative new idea for distribution of index insurance to overcome the typical demand challenges faced in index insurance interventions. That brief on what is called the "[VISA Model](#)" is also available on the AMA Innovation Lab website.

For more information on this project, please see our [website](#).

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Achievements

Since the start of this award, the research team has been devoted to seeing if they can design an index insurance contract of sufficient quality to reach a “sweet spot” of affordable contract design and minimized risk of contract error (no payouts triggered despite widespread losses).

Through the initial phases of research to determine target regions and commodity, researchers identified rice farming in the Terai region of the country as the focus that has the potential for both a high-value contract and high development impact (in that researchers observed that a risk transfer tool like insurance could unlock growth opportunities for the target population).

Capacity Building

Throughout this study, the AMA Innovation Lab researchers have conducted capacity building with USAID mission personnel, GoN leadership and staff, private sector stakeholders, and NGOs and other stakeholders, to improve understanding of index insurance and its potential (and limitations) as a risk management tool.

These capacity building efforts created numerous materials that can continue to be used for capacity building, including presentations and briefings materials that can be used for formal presentations or informational working meetings.

In addition, a PhD Candidate at the University of California Davis, Jisang Yu, worked in close collaboration with Dr. Carter on this project in his final years in the program and as he transitioned to a permanent position at Kansas State University.

Lessons Learned

Index insurance for development and growth opportunity is maximized in the “sweet spot” between excellent index design and areas in which better risk management will enable farmers to take advantage of productive investment opportunities that are available to them.

In addition, the analysis of the potential indices against farmer yield recall surveys (and yield data supplied by the GoN) created new lessons regarding specific conditions under which such indices may - and may not - be appropriate or effective for use in an index insurance contract.

Specifically, the research team discovered that the heterogeneous landscape creates a significant challenge

Throughout the process, the research team worked with a variety of stakeholders in the country, including the private insurance sector, NGOs and savings groups, banks, and government officials.

Although the Government of Nepal (GoN) was unable to commit to the pilot proposed by researchers, bringing the work essentially to a halt, this work refined a lot of processes necessary to assess the feasibility of index insurance. This work also inspired new ideas about how to overcome many of the demand challenges that frequently arise in index insurance interventions (please see the brief write-up of the “VISA Model” for additional information).



for the design of an index. In hilly areas, for example, the experience of a farmer at the top of the hill may dramatically differ from that of a farmer at the bottom. When the pixels from satellite imagery are fairly large - as is the case with most freely available data - the imagery cannot differentiate the farms on the hilltop from those in the valley. In addition, even when examining the relatively homogeneous landscape of the Terai (plains), satellite imagery cannot be used effectively due to the density and pervasiveness of the cloud cover from the monsoons that characterizes the growing season.

AMA Innovation Lab researchers are working to refine these lessons so that they can provide guidance for future investigations into index insurance.

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PROJECT REPORT: Building Resilience and Assets for Food Security in Bangladesh

This collaborative project with BRAC-Bangladesh explores how risk-reducing technology, combined with flexible financial instruments for risk management, impacts farmer welfare.

Bangladeshi farmers and rural inhabitants are exposed to high production risks, in particular due to frequent droughts and floods. These uninsured risks take a heavy toll on welfare, productivity, income, and asset ownership. They are a main cause of impoverishment when shocks occur, and they can keep people enmeshed in chronic poverty due to the high costs of self-insurance.

Researchers hypothesize that traditional financial products (transfers, savings and credit) delivered by micro-finance institutions can be adapted to farmers' and rural inhabitants' demands for risk management and risk coping services. For this, financial products need to be made more flexible, without compromising clients' willingness and ability to save and repay loans. Financial products also need to be made contingent on exposure to verifiable health and weather shocks. This research will also examine whether financial products and technological innovations (stress resistant seeds) can be combined to effectively cover different layers of risk.

This study will be conducted over nine districts from the Rajshahi, Rnagur, and Khuna divisions that are particularly prone to drought, and where the new drought-tolerant technology could make a large difference in yields when drought occurs.



Collaborations

LEAD PI: Elisabeth Sadoulet, University of California Berkeley

CO-PI: Alain de Janvry, University of California Berkeley

CO-PI: Jeremy Magruder, University of California Berkeley

Collaborators: Dr. Mahabub Hossain (Executive Director) and Narayan Das (Research Evaluation Department), BRAC

Associated Researchers: Vianney Dequiedt (CERDI)

Project Outputs

Emerick, Kyle, Alain de Janvry, Elisabeth Sadoulet, and Manzoor Dar. A pilot evaluation of BD56, an early-maturing and drought-tolerant variety for Bangladesh. Policy Brief. 2016.

Lane, Gregory. "Credit as Insurance: Emergency Index Loans". UC Berkeley, ARE department 2016.

For more information on this project, please see our [website](#).

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Achievements

In the Fall of 2015, the Emergency Loan product was piloted in 12 BRAC branches. Approximately 350 loans were issued in the eight branches where the flood level triggered the loan availability (or about 21 percent of the total eligible clients in these branches).

In the winter of 2015, researchers and partners implemented the full-scale RCT across 200 branches, selected based on their exposure to flood risk and their proximity to river height gauges that are used to trigger the availability of the pre-approved Emergency Loan. The credit-score software that is used to assign eligibility for the loans was refined and delivered to these branches in April 2016, with training for BRAC managers in April and May, to ensure good communication of the new financial product to eligible BRAC clients.

Capacity Building

Training on how to manage the Emergency Loan product and improve communication with BRAC clients was conducted from May 10, 2016 to May 25, 2016. The purpose of the training was to provide a good understanding of the details and benefits of the Emergency Loan product as well as to improve the quality of communication with BRAC clients about the new product.

Gregory Lane, a PhD student at UC Berkeley, was sent to Bangladesh to organize the Emergency Loan RCT with BRAC and to oversee data collection from 4,000 BRAC clients.

Lessons Learned

Case studies interviews of BRAC microfinance clients from 12 pilot branches indicated two lessons: 1) the Emergency Loans were overwhelmingly used to rebuild income generating activities (new seed or inputs to replace lost crops, replacing livestock, etc.), and 2) Up-take was concentrated among clients who reported financial loss from the flood; therefore they seem to be filling a need for emergency liquidity, rather than simply offering more credit for long standing investments.

This provides evidence that there is, indeed, extra demand for credit specifically after income losses, rather than just serving as a general expansion of credit in a constrained population. In other words, the pilot seems to indicate

that the loans are being used as intended: to help these vulnerable populations to cope with the results of negative shocks and to recover more effectively.

At the beginning of June the credit-score software was run and BRAC clients with scores above the eligibility threshold were put on lists to be notified about their pre-approval for the Emergency Loan. In total, about 30,000 BRAC clients in the treatment branches were deemed eligible for the loan.

With regard to the agricultural technology, the BD56 variety is a recently released variety that offers both early maturity and drought tolerance. The pilot evaluation was carried out in 35 villages in western Bangladesh; results suggest that BD56 matures earlier and changes the cropping calendar for farmers - potentially benefitting crops grown outside the wet season (but yielding less than the longer duration varieties). This variety is going to move to full-size field experimentation in the coming year (see more below).



The research team is currently running the full experiment involving the drought tolerant variety to better understand its impacts. Seed distribution took place in June 2016, and farmers were given calendars with important dates for their rice production. The study will measure both the overall profitability impacts throughout the entire cropping year and study alternative methodologies of agricultural extension for increasing diffusion. Results from this experimental arm are expected soon.



RESEARCH THEME 2

ENCOURAGING ADOPTION OF IMPROVED TECHNOLOGY

Agricultural research has typically focused on advancing the technological frontier; however, the fact that average small farm yields consistently fall well below what is technically possible indicates that the benefits from these innovations are not being realized by farmers. AMA Innovation Lab researchers are working to better understand these roadblocks that stop farmers from adopting new innovations, and test innovations to remove these roadblocks.

Michael Carter, University of California Davis, "Evaluating the Socio-Economic Impacts of Western Seed's Hybrid Maize Program in Kenya"

Andrew Dillon, Michigan State University, "Demand and Supply Constraints to Improved Sorghum Technology Adoption and their Gender-Differentiated Effects in Burkina Faso"

Travis Lybbert, University of California Davis, "Household-Level Impacts of System of Rice Intensification (SRI) in Haiti."

Aprajit Mahajan, University of California Berkeley, "A Multiple Interventions Approach to Increasing Technology Adoption with a View Towards Scaling Up: Evidence From Mexico"

Cheryl Palm, Columbia University, "Evaluating the Effect of Site-Specific Soil Information on Farmer Input Choices and the Relationship between Poverty and Soil Quality in Tanzania"

Stephen Smith, George Washington University, "Complementarities of Training, Technology Adoption, and Credit in Smallholder Agriculture: Impact, Sustainability, and Policy for Scaling-Up in Senegal and Uganda"

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PROJECT REPORT: Evaluating the Socio-Economic Impacts of Western Seed's Hybrid Maize Program in Kenya

Researchers hope to learn about the effectiveness of a local seed company in developing technologies fine-tuned to the local environment, and the impact of relaxing liquidity constraints on technology adoption.

In the mid-1990s, the government of Kenya began to slowly liberalize the domestic seed market. Western Seed Company (WSC), an early entrant in the newly opened market, released its first commercial maize varieties in 1999, which quickly garnered attention by out-yielding existing varieties by 30 percent, especially in the mid-altitude regions that are home to many small-scale Kenyan farmers. WSC subsequently attracted venture capital from AGRA and social impact investors motivated by the hypothesis that an agile, well-funded, locally-based and locally-focused seed company could create and market the technological innovations needed to boost the productivity of small-scale maize producers, and to improve their living standards.

This venture capital-powered expansion of WSC supply allows researchers to get out in front of their geographic expansion to conduct a rigorous impact evaluation. WSC itself is interested in this study and have committed to a two-year randomization design. This study will identify a mix of second-generation hybrid adopters (as hybrid users shift from other seeds to WSC seeds) and first-time hybrid seed users.

This research will investigate the welfare gains that accrue from introducing a new kind of market actor that has the incentives, capacities and focus to innovate in ways that are different from both traditional parastatals and international seed multi-nationals.



Collaborations

University of California, Davis

Michael Carter, Professor (PI)
Travis Lybbert, Professor
Samuel Bird, PhD Candidate

University of Wisconsin, Madison

Emilia Tjernstrom, Assistant Professor

Tegemeo Research Institute

Mary Mathenge, Director
Timothy Njagi, Research Fellow

Project Outputs

University of California, Davis and Tegemeo Institute, Egerton University. The Impact of Western Seed Company Maize Hybrids on Smallholder Farm Households in Mid-Altitude Kenya. August 2016.

The research team is also drafting policy briefs for findings from this research, and planning a major dissemination event in Nairobi for February 2017.

For more information on this project, please see our [website](#).

Achievements

The midline survey for this intervention was conducted in 2015, and the midline report finalized and circulated to funders in October 2015. A phone survey of the full sample was completed on October 30, 2015 to collect data on planting and harvesting of maize in the first season of 2015.

Researchers were encouraged to observe that there was higher net uptake of WSC maize hybrids compared to previous seasons. This was due in part to an intervention by the research team that offered direct delivery of seeds to treatment villages for planting in the first season of 2015.

An endline survey was conducted in Feb-March 2016.

Capacity Building

Most of the capacity building on this project occurs in preparation for fieldwork, in particular the part-time and full-time staff at Tegemeo Institute as well as graduate student researchers from the University of California, Davis. Capacity building in the past fiscal year included the following:

- Twenty-five enumerators were trained to use tablets for implementing the endline survey. Though some enumerators had used the tablets in the baseline and/or midline surveys, the training emphasized how tablets can be used to pre-load information for households from the baseline and midline surveys in interview prompts.
- One graduate student from the University of California, Davis was supported and trained under this project in fiscal year 2016, with Sam Bird advancing to candidacy in his doctoral program.

Lessons Learned

Key findings from the midline report focus on the effect of the two randomized treatment arms of the research design: 1) receipt of a small sample pack of WSC hybrids, and 2) receipt of a bag of fertilizer. The endline survey was designed to capture the mid-term effects of these interventions, as well as a subsequent seed delivery program to households in the seed treatment.

In the Western region, interventions to increase uptake of Western Seed Company maize hybrids among treatment farmers only increased endline adoption 15% over the control group mean of 9% adoption. There is promise and discouragement in these numbers. Control group adoption of 9% is not insignificant, suggesting the regular marketing approach of WSC is inducing a fair number

of farmers to adopt. Failure to reach 25% adoption in our treatment areas, however, suggests that there may be a limit to the potential market for WSC in Western Region. Furthermore, the study areas were identified as marketing opportunities by WSC, suggesting an even larger geographic disparity in adoption in areas that were not identified as having high marketing potential by WSC. In the Central region, endline adoption among treatment farmers was just below 10% and virtually no control farmers used WSC hybrids during the study period.

The research team also collected parcel size measurements via GPS as part of the endline survey, which can be matched to improve the accuracy of plot-level analyses using agricultural production data.



of farmers to adopt. Failure to reach 25% adoption in our treatment areas, however, suggests that there may be a limit to the potential market for WSC in Western Region. Furthermore, the study areas were identified as marketing opportunities by WSC, suggesting an even larger geographic disparity in adoption in areas that were not identified as having high marketing potential by WSC. In the Central region, endline adoption among treatment farmers was just below 10% and virtually no control farmers used WSC hybrids during the study period.

As for impacts of WSC hybrids and inorganic fertilizers on adopters, WSC maize hybrids appear to be more productive than non-hybrids but not more productive than non-WSC hybrids.

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PROJECT REPORT: Demand & Supply Constraints to Improved Sorghum Technology Adoption & Their Gender-Differentiated Effects in Burkina Faso

Researchers are working with sorghum breeders and agro-input suppliers to compare alternative mechanisms to encourage adoption of improved seed and fertilizer micropacks.

Supply and demand constraints reduce the adoption of improved sorghum technology in the West African Sahel. Researchers are with implementation partners in Burkina Faso to compare alternative mechanisms to encourage the adoption of these technologies.

A demand side treatment will be targeted by social network characteristics to understand the information effects of farmer take-up and spillover based on social network characteristics from randomized distribution of micro-packs. A social network census will reveal the extent to which villages insure one another against idiosyncratic risk. The supply side of this randomized control trial will test whether consistent market supply, credit constraints and farmer commitment explain low adoption and potential supply side marketing mechanisms to increase adoption.

Researchers will also examine the gender dimensions of adoption of these technologies. The new technologies are time-consuming and laborious. If technology adoption diverts women's labor from their fields to sorghum fields, the household's dietary diversity and women's income may decline, as well as induce intrahousehold labor substitution among women and children. Women's bargaining power within the household may also be affected.



Collaborations

LEAD PI: Andrew Dillon, Michigan State University
CO-PI: Maria Porter, Michigan State University
CO-PI: Melinda Smale, Michigan State University
CO-PI: Isabelle Dabire, National Agricultural and Research Institute (Ouagadougou, Burkina Faso)
CO-PI: Souleymane Ouedraogo, National Agricultural and Research Institute
CO-PI: Adama Traore, National Agricultural and Research Institute
CO-PI: Estelle Plat, Innovations for Poverty Action (Burkina Faso)
CO-PI: Nicolo Tomaselli, Innovations for Poverty Action

Project Outputs

Researchers have produced non-print outputs over the first two years of the project including five datasets, a [project brief](#), and 10 stakeholder meetings to build support for the project and solicit feedback from stakeholders on the design of the project.

Researchers began data analysis for three working papers and presented preliminary results at the [2016 AAEA meetings in Boston](#) from one of these working papers.

For more information on this project, please see our [website](#).

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Achievements

In the first half of this past fiscal year, researchers were challenged by some data issues. Specifically, they discovered a number of issues with the social network census data and with merging various data files, particularly across survey waves. They have, however, worked with their partner Innovations for Poverty Action to clarify remaining questions.

Researchers have completed data cleaning of the follow-up and adoption surveys. The research team has preliminary results to inform three working papers, which they are working to finalize.

Capacity Building

In the past annual reporting period, the Michigan State University team has continued to engage with the Institut de l'Environnement et de Recherches Agricoles (INERA) research team to develop qualitative research on gender and sorghum technology adoption.

In addition to the substantial capacity building in which the Michigan State University research team has been engaged as part of their collaboration with their local partners, a graduate student was funded through the AMA Innovation Lab during the previous academic year. A second graduate student also worked on this project through funding from the Gates Foundation and will continue in the upcoming academic year.

The research team will continue capacity building - including through their dissemination work - in the coming year.

Lessons Learned

Researchers are currently analyzing data from the five surveys conducted and will present key findings and results at the dissemination workshop in Ouagadougou and the Mind the Gap Conference at for USAID and other relevant program developers, both in November 2016.

On the supply side treatments, researchers do have information from take-up rates across groups D (farmers were offered early commitment to purchase the improved packet at fixed market price), E (the late offer of the improved packet for purchase) and F (the late subsidized improved packet). The objective of these different treatment groups were to disentangle the effect

Dissemination activities were delayed due to the [bombing in Ouagadougou in January 2016](#) which caused us to extend the project to the middle of 2017 to ensure results are well-analyzed and distilled into appropriate materials effectively, without the pressure of an impending end date. The bombing limited travel and stakeholder meetings (including meetings with mission) during this time.

The research team is also seeking funding for follow-on work for a related random controlled trial to examine the extent individual farmer preferences are consistent across time and whether this influences take-up rates in the different experimental groups included in this study.



of the farmer's commitment problem due to liquidity constraints from that of the effect of price on adoption. To address two significant supply side adoption constraints, these interventions - price discounts and commitment mechanisms to enable farmers to purchase micro-packets at periods of time with lower liquidity constraints - were offered.

Take-up in group D (early commitment) was much greater than the take-up in groups E and F, (both late commitment) consistent with previous work in this area. This is consistent with [previous work in Kenya by Duflo et al. \(2011\)](#).

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PROJECT REPORT: Household-Level Impacts of System of Rice Intensification (SRI) in Haiti

The research team will conduct a randomized control trial of SRI to test the household-level impacts of SRI, the effect of coordinated SRI adoption on these impacts, and the mechanism behind coordination.

Haiti is one of the poorest and most food insecure countries in the world, and improvements in productivity for staple crops such as rice are crucial to improve rural income and food security. The System of Rice Intensification (SRI) is touted as a high-yielding low external input rice cultivation method that can increase rice yields and improve household welfare, but these claims remain controversial and inconsistent, with widespread disadoption in some contexts.

Also, because SRI demands more precise water control, coordination problems often emerge with shared local irrigation infrastructure. Addressing these coordination constraints may raise adoption rates and increase the benefits of SRI, but little is known about the magnitude of these constraints and their determinants.

In collaboration with Oxfam America as implementing partner, the research team will conduct a randomized control trial of SRI to test the household-level impacts of SRI, the effect of coordinated SRI adoption on these impacts, and the mechanism behind the coordination efforts. This study aims to inform these types of programs and supporting policy work by providing a unique evidence basis for such intervention strategies.



Collaborations

Travis J. Lybbert

Associate Professor, Agricultural & Resource Economics, University of California, Davis

Robers Pierre Tescar

Professor, Faculté d'Agronomie et de Médecine Vétérinaire (FAMV), Université d'Etat d'Haiti

This research is also being conducted in collaboration with the implementing partner for the intervention, Oxfam America.

Project Outputs

Turiansky, Abbie. "System of Rice Intensification: adoption patterns and household impacts." 14 September 2016.

Additional publications forthcoming as data continues to be analyzed and results are interpreted. The research team anticipates to have several more publications (including policy briefs) in the next year.

For more information on this project, please see our [website](#).

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Achievements

This past year was the final intervention year for the SRI project in Haiti, and the last year of data collection for the evaluation of the intervention. Preparations for the last round of intervention work began in February 2016 with a kickoff coordination meeting hosted by Oxfam America in Boston, which included the collaborators from Haiti. At the meeting, the research team presented preliminary results and discussed the final project plans and the dissemination event planned for December 2016 in detail.

This work consisted of maintaining the SRI information and credit support in the treated blocks and expanding the training and credit package to the original control blocs of the study.

Capacity Building

During this period, the research team convened two research meetings that included important capacity building elements.

First, in Feb 2016, the research team convened a research team meeting at the Oxfam America offices in Boston, MA. The research manager from FAMV and two members of the Oxfam team from Haiti attended the meetings.

Second, in July 2016, the research team convened a planning meeting at the Oxfam office in Haiti. Again, colleagues from FAMV and Oxfam attended.

Lessons Learned

While researchers have so far observed increased yields for SRI farmers, they have failed to detect an impact on either farm profits or household-level income. They do find a small, but statistically insignificant, negative impact of SRI adoption on self-reported food security, which appears to be driven by food insecurity during the planting season, when the high costs of implementing SRI may prevent families from being able to purchase enough food.

It is possible that the inability to detect an impact on profits or income is due to the low adoption of the technology in technology in the study: only 28 percent of treated farmers experimented with this new technology in the first year of the program, and nearly half of them disadopted in the second year.

Data collection for the endline survey began in March and concluded in late April. In addition to a final survey round with the original sample of households in the two treatment and two control blocks, the research team added a random sample of households from two nearby “pure” control blocks, in order to test whether the two project ocontrol blocks had benefited measurably from the baseline credit they received as part of the project.

Once this data was collected and cleaned, final analysis started in earnest. The research team continues to plan a dissemination event for December 2016.



While adoption of the full technology package is low, farmers exposed to the technology adopt some components of the technology in a form of partial adoption, moving toward SRI-like practices without adopting SRI completely. Farmers exposed to SRI training are also more likely to be able to describe the specifics of their cultivation process, indicating that SRI training not only taught farmers a new planting technique, but may have focused their attention to the specific techniques they are using.

Analysis is ongoing, and additional results are anticipated over the next year.

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PROJECT REPORT: A Multiple Intervention Approach to Increasing Technology Adoption with a View Towards Scaling-Up: Evidence from Mexico

The research team is testing whether small farm productivity remains low in developing countries in part because farmers lack information about soil quality and - as a result - inappropriately use inputs.

Crop yields in much of the developing world remain below potential, in part, due to low adoption of profitable technological packages, in particular, improved seeds and fertilizer. In Mexico alone, average maize yields among smallholders without access to irrigation are below 2 tons/hectare, similar to those in Africa.

The research team is conducting a series of randomized experiments to measure how personalized inputs based on plot-specific soil analysis (SA) and extension services contribute to productivity, and whether and how these translate into increased household welfare. By separately measuring the impact of each intervention, the researchers hope to identify the bottle necks in the causal chain limiting adoption of these technologies.

The relevance of this research lies in simultaneously addressing some of the most prominently cited barriers to technology adoption for smallholder farmers, including lack of credit or liquidity, insufficient information about optimal input use, and limited use of complementary inputs. This project addresses financial and risk barriers to agricultural technology adoption, which in turn has an impact on productivity and helps in graduating households from social protection schemes.



Collaborations

Dr. Aprajit Mahajan

Associate Professor, University of California, Berkeley

Dr. Enrique Seira

Assistant Professor, ITAM

Dr. Xavier Gine

Lead Economist, The World Bank

MSc. Carolina Corral

Research Director, Que Funciona para el Desarrollo AC

Project Outputs

No project outputs have been created by this project to date, aside from progress reports. Researchers anticipate that in the next year, they will draft a policy brief that will be published in both English and Spanish, to be sent to local policymakers, the World Bank, and FAO researchers and implementers, along with other relevant stakeholders. This will be based on an academic paper. Researchers also plan to hold a series of briefings and presentations to disseminate these findings once they are finalized.

For more information on this project, please see our [website](#).

Achievements

Results from the first year of experiments suggested considerable variation in plot characteristics that translate into large variations in the optimal input mix required to maximize maize yields. In addition, researchers found suggestive evidence that personalized soil analysis, improved seeds and extension services also increased yields even though farmers were unable to obtain personalized input packages.

In November 2014, researchers started the second wave of the project with the aim to elucidate the causal chain further by providing small maize farmers with in-kind grants to acquire personalized inputs and precision drills that allow them to fertilize at sowing. Researchers will

Capacity Building

Farmers were offered, as part of the intervention, extension services from IPAMPA, a local private extension service company. Previous studies suggested that agricultural extension services were useful, and in focus group discussions farmers were keen to try out the new set of recommendations and expressed interest in extension advice on the implementation of the recommendations to their specific plots. The extension services package consisted of three group training sessions and two plot visits by IPAMPA Agricultural Extension Workers (AEWs) to interested farmers.

The first group meeting introduced the precision sowing drill and the sowing phase. The second covered the application of fertilizer. The final was held just before harvest and emphasized field preparation. AEWs used these visits to verify the correct functioning of the sowing machinery and further instruct farmers on detecting nutrient deficiencies and other problems with their crops.

Lessons Learned

The intervention in 2015 provided farmers with in-kind grants to acquire quality inputs based on plot specific soil analyses and precision drills that allow them to fertilize at sowing (two interventions that have been promoted for a long time by CGIAR/CIMMYT in Mexico).

Researchers find considerable variation in plot characteristics that translate into large variation in the optimal input mix to maximize yields. In addition, and although Tlaxcala suffered a 30-day drought, researchers found suggestive evidence that the intervention increased productivity by 100-250 kilograms per hectare, although this difference is only marginally significant at conventional levels of significance.

evaluate the effects of these in-kind grants on productivity and agricultural profits. This first-round intervention and preliminary analysis led to crafting of the second-round intervention, as described below.

The overall goal of the 2015 intervention was to examine one particular source of heterogeneity in detail - heterogeneity in land quality - and its link to input use and technology adoption. In particular, the research team tested whether tailored recommendations improved yields in field conditions. This is particularly relevant in the developing world where fertilizer recommendations are usually generic, untailed to agro-climatic variations.



This data collection included information on self-reported sowing and first fertilization practices for the following agricultural cycle after the intervention ended. Importantly, the follow-up survey carried out in the summer of 2016 - after the end of the main intervention - shows that farmers continue to implement many of the recommendations provided in 2015.

From September to December 2016, researchers will conduct a crop-cutting estimation of all the plots who participated in the program in order to quantify the impact of the persistence of the adopted techniques on this year's yield.

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PROJECT REPORT: Evaluating the effect of site-specific soil information on farmer input choices and the relationship between poverty and soil quality

Researchers & collaborators developed a rapid on-farm soil diagnostic kit to provide farm-specific management recommendations (SoilDoc) to see if that knowledge leads to more effective input use.

Poor soil quality and the associated low crop productivity is linked to the pervasive rates of poverty and malnutrition ensnaring much of Africa. One challenge is that small-scale farmers do not know the status of their soils. Despite soil heterogeneity in soil types and other conditions, governments generally set a single input use recommendation for the country. This method can raise yields to a point, but to obtain higher yields it will require a targeted approach that addresses specific soil constraints to make efficient use of environmental and economic resources.

SoilDoc, a rapid, on-farm soil diagnostic kit will be used with information communications technology (ICT) to provide farmer-specific management recommendations. This research will test the central hypothesis underlying SoilDoc: that farmers will apply productive inputs more effectively and increase yields in response to improved information about soil quality.

Their approach employs a randomized control trial to evaluate how improved soil information impacts yields, production inputs used by farmers, and welfare of farming households, testing the hypothesis in the field (Morogoro, Tanzania). The study will also test whether available assets constrain farmers' ability to obtain inputs by providing some farmers a cash grant with the soil information, information only, a cash grant only, or neither. This will allow researchers to observe whether the cash grant increases the impact of information about soil.



Collaborations

LEAD PI: Cheryl Palm, Columbia University

CO-PI: Johnson Semoka, Sokoine University

CO-PI: Nyambilila Amuri, Sokoine University

CO-PI: Chris Magomba, Sokoine University

CO-PI: Hope Michelson, University of Illinois

CO-PI: Malgosia Madajewicz, Columbia University

CO-PI: Aurelie Harou, Columbia University

Collaborator: Ray Weil, University of Maryland

Collaborator: Lydiah Gatere, Columbia University

Project Outputs

There were extensive outputs by this project in the past year, but all were non-academic in nature and were not designed for public consumption. This includes information cards, fertilizer recommendations, survey procedures documents, training manuals, and other related documents.

Researchers, now in the final year, are preparing documents for submission to academic journals, as well as drafting briefs. The AMA Innovation Lab wrote a project summary, or "[thumbnail](#)" for the project.

For more information on this project, please see our [website](#).

Achievements

The intervention was implemented in two phases. Farmers were first invited to attend an information meeting during which a team of agronomists from the Sokoine team explained the fertilizer recommendations and the vouchers. A team of two agronomists spent time with them to explain the recommendations in detail.

Because farmers not receiving fertilizer recommendations but who were receiving the vouchers expressed concern that they didn't know what inputs they should purchase, the team decided to communicate orally the standard district recommendations to all farmers that didn't directly benefit from soil specific information (control and voucher groups).

Capacity Building

This research is supporting a MSc student at Sokoine University. Her research topic is "Soil Nitrate Test to Assess Nitrogen Fertilizer Needs for Tropical Soils: A Case of Morogoro Rural, Tanzania." The objective of the research topic is to determine best sampling time for fertilizer recommendations and response of maize to different rates of nitrogen fertilizers based on soil nitrate test by SoilDoc. The goal of this training activity is to build capacity in soil fertility, specifically soil testing methods for accurate fertilizer recommendations to improve both soil quality and productivity.

The research team conducted one pilot and two trainings:

- 1) pilot of the intervention phase.
- 2) training of two agronomists for the intervention phase.
- 3) training of a team of 25 enumerators for the final survey round.

Lessons Learned

Researchers have some preliminary information from the intervention, despite the fact that analysis is ongoing.

Looking at farmers' perceived gains by applying an additional 25 kg/ha of fertilizer on their main maize plot, researchers observe that farmers firmly believe in the usefulness of fertilizer, however good the season is. When looking at farmers' top factors affecting maize yields in the 2014 long rains season, soil properties appears to be one of the major issue for most respondents after rainfalls.

Using the GPS coordinates and the digital elevation model, researchers classified farmers' main maize plots into the

Farmers in recommendation groups, on the other hand, received a piece of sturdy cardstock printed with the specific fertilizer types and amounts recommended for maize (recommendations; voucher and recommendations groups).

Farmers who had vouchers could decide whether to use the voucher to buy fertilizers, redeem 85% of the total voucher value into cash, or both purchase fertilizers and receive some cash back (by using less than the full value of the voucher).

The endline survey has now been implemented, but analysis of the data has only just begun.



characteristic slope gradients. Farmers with hilly and steep slopes experience a severe decline in productivity (1,108 kg/ha of maize produced for farmers below the 15% mark vs. only 745 kg/ha of maize for farmer above it).

Researchers estimated several production functions to estimate the effect that a limiting nutrient has on farmers' yields. In other words, they are interested in estimating the gains to production if a household no longer has limiting nutrients -- what are the potential gains from the information provided by SoilDoc? They find that limiting nutrients have negative effects on production, as expected.

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PROJECT REPORT: TRAINING, TECHNOLOGY, AND CREDIT IN SENEGAL AND UGANDA

This research will investigate the degree to which smallholder farmers make the required investments sustainable, the obstacles they face, & whether additional interventions help overcome these obstacles.

Many technologies and improved farming practices hold great promise for boosting agricultural production and reducing poverty in developing countries, yet in Sub-Saharan Africa the adoption of such technologies has been slow. Up-front costs, lack of effective and reliable supply chains, and information gaps are clear barriers that often work together to prevent or delay technology adoption. A farmer may, for example, be reluctant to make the large, risky investments needed to invest in a new technology like fertilizer or improved seeds, but combine an initial subsidy and supply of inputs with training should, in theory, help overcome these obstacles.

Training programs and time-limited input subsidies or capital are often used to overcome barriers to farmers' technology adoption. Yet how successful are these strategies in achieving sustainable long-term adoption of improved agricultural technologies, especially after these programs cease? Do farmers continue to make the necessary complementary investments to sustain the technology usage?

This research will evaluate two separate programs in two countries, Senegal and Uganda. It will focus on the degree to which smallholder farmers make the required investments sustainable; the financial and behavioral obstacles they face in doing so; and whether additional interventions help farmers overcome these obstacles. The Uganda program (fertilizer and improved seed) exclusively targets female smallholder farmers; the Senegal program (drip irrigation for vegetable production) works with both women's farmer groups and in some cases mixed groups.



Collaborations

PI: Dr. Stephen C. Smith, George Washington University

Co-PI: Dr. Ram Fishman, GWU

Partner Co-PI: Dr. Munshi Sulaiman, BRAC

Partner Co-PI: Dr. Sarah Ssewanyana, EPRC

Partner Co-PI: Dr. Abdoulaye Diagne, CRES

Investigator: Dr. Mwangi Kimenyi, Brookings Institution

Investigator: Dr. Dov Pasternak, Ben-Gurion University

Investigator: Ms. Yao Pan, GWU

Project Outputs

Ram Fishman, Stephen C. Smith and Vida Bobic "How Sustainable Are Benefits from Agricultural Extension Programs for Smallholder Farmers? Evidence from a 'Reverse-Randomized Control Trial' in Uganda": most recent draft, August 2016, 52 Pages.

Vida Bobic, Stephen C. Smith and James E. Foster, "Measuring Multidimensional Women's Economic Empowerment: Framework and Application to Programs for Women Smallholder Farmers in Uganda and Senegal: Research Note," current draft, July 2016. 21 pages.

Yao Pan, Stephen C. Smith and Munshi Sulaiman "Agricultural Extension and Technology Adoption for Food Security: Evidence from Uganda." Revised and resubmitted August 2016, now 51 pages.

For more information on this project, please see our [website](#).

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Achievements

In Senegal, researchers have successfully completed the baseline households survey in all 124 study villages (half treatment and half control). The datasets created include household, agriculture group, village and market surveys. 1,277 households were surveyed, as well as 120 village and agriculture group surveys and 44 market surveys. The data has been checked, cleaned, and coded, and results confirmed that the treatment and control groups are well balanced.

Researchers have piloted and are soon to launch supplemental data collection from village farmer associations via mobile phone. This is in part to provide clarifications on ambiguous information, and to follow up

on progressions in the originally proposed research ideas.

In Uganda, the follow-up round of survey data was collected in Feb-March 2016. The data have been received and checks conducted, and the systematic work to clean and code the data will begin early in the next year.

The research team has drafted and submitted several research papers for publication. The process of presenting working papers and soliciting feedback from external referees has led to a series of revisions and resubmissions. The research team is optimistic that these papers will prove relevant and successful.

Capacity Building

Boubacar Sow, a young researcher attached to one of our research partners in Senegal went to Israel for a short-term training program directed by Ram Fishman.

The research team has also begun to work with MASHAV (Israel's Agency for International Development Cooperation) in providing input into information that can be collected in the process of their upcoming joint horticulture training programs.



Lessons Learned

The results from the baseline survey in Senegal are still being analyzed. At the writing of this annual report, researchers anticipating having a draft baseline report within a month, and anticipated two working papers (and prospective publications) are likely to emerge from analysis of the baseline data.

Researchers have completed a full working draft of a paper entitled "How Sustainable Are Benefits from Agricultural Extension Programs for Smallholder Farmers? Evidence from a 'Reverse-Randomized Control Trial' in Uganda." This paper has been presented at myriad venues, which has helped to further develop the paper. The research team

plans to submit the paper for publication soon. Additional papers are being drafted. More will continue to be drafted as the follow up round household survey is cleaned, coded, and analyzed.

Results from these papers are not yet finalized, so not yet shared here. These findings should be available by the time the next annual report is submitted.



RESEARCH THEME 3

COMBINING RISK MANAGEMENT & AGRICULTURAL TECH

By simultaneously addressing financial constraints and other constraints to the adoption of improved technologies, a multiple interventions approach may have development impact far greater than either of these innovations would have in isolation.

Michael Carter, University of California Davis, "Climate Resilience and Index Insurance Program for Small Farmers in the Dominican Republic"

Lorenzo Casaburi, Stanford University, "Tailoring Contract Farming to Smallholders in Kenya: Experimental Evidence on Enrollment Impact, Insurance Provision, and Communication Technologies."

Mario Miranda, The Ohio State University, "Promoting Adoption of Improved Production Technologies in Ghana via Coupled Credit and Insurance Contracts."

Chris Udry, Yale University, "Disseminating Innovative Resources and Technologies to Smallholders in Ghana (DIRTS)"

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PROJECT REPORT: Climate Resiliency and Index Insurance for Smallholder Farmers in the Dominican Republic

This research is evaluating a program that aims to offer smallholder dairy farmers tools to manage risk and to improve their livelihoods with information, improved practices, risk transfer mechanisms & credit.

The Dominican Republic (DR) consumes 760 million liters of milk and is home to 59,000 producers with approximately 1.2 million heads of cattle. The Northwestern region of the country is a large and poor region with a vulnerable population. The average producer owns fewer than fifty heads of cattle and the average farm is 2-5 hectares, most of which are held without a title. In this region, 94 percent of farmers indicate that drought is the major risk for cattle operations and milk production.

Adaptations to weather risks are available, including building or fortifying water dams, building irrigation systems, water resource preservation and protection, water storage facilities, reforestation plans, etc.

These measures, however, are largely not adopted in this region. This intervention seeks to test whether a risk management tool - here, index insurance - could protect farmers from climate risk and enable them to make productive investments in their production and in climate change adaptation.

USAID and other partners are implementing a project in the DR that aims to offer smallholder dairy farmers the tools they need to cope with climate risk and to improve their livelihoods. The program includes four complementary interventions, including 1) develop access to climate and weather information, 2) implement “climate smart” agricultural practices, 3) increase access to risk transfer mechanisms, and 4) increase access to credit for smallholder producers.



Collaborations

Michael Carter

Professor, Agricultural and Resource Economics
University of California, Davis

This research is a collaborative project that brings together USAID, the International Research Institute (IRI) at Columbia University, Swiss-Re, Guy Carpenter, CaribRM, REDDOM, ADOPEM, Seguros Ban Reservas, and AMA Innovation Lab researchers at the University of California Davis.

Project Outputs

To date, this project has not produced any public outputs for dissemination, as the intervention has yet to be fully implemented, and so has not been evaluated for impact.

As the implementation of the project begins and preliminary results emerge, the researchers will begin dissemination efforts, including presentations, academic papers, and policy briefs.

For more information on this project, please see our [website](#).

Achievements

Repeated delays in the implementation of the intervention have provided opportunities for a re-evaluation of the insurance product being used. The AMA Innovation Lab team continues to investigate the potential for an optimized insurance product that uses remote sensing data, in partnership with a remote sensing firm called Vencore to develop a crop-masking model tailored to the challenges faced in the Dominican Republic.

The AMA Innovation Lab evaluation team also launched a series of focus groups to help them better understand the costs farmers incur when confronted with a major weather shock and the associated losses. Conversations with the local dairy farmers indicated that these drought episodes

under investigation do more than negatively impact milk production (via reduced production).

Perhaps more importantly, there is often a dramatic increase in the cost of production. This indicates that even as production (yields) decrease, the costs of this lower level of production increase, which are a double hit on profits for these already vulnerable smallholder farmers.

Unfortunately the data for production costs in the dairy sector is not readily available, so this could not be empirically confirmed.

Capacity Building

Several University of California Davis students have taken part in this project under the mentorship of the Principal Investigator, Dr. Michael Carter. The field research opportunities presented are a unique and vital part of their pursuit of a PhD in the program that hosts the AMA Innovation Lab, the Agriculture and Resource Economics Department of the University of California Davis.

As part of their capacity building, these students work with Dr. Carter and on-the-ground implementation partners to ensure the design and implementation is leading the way to a rigorous impact evaluation.

In addition, these students have worked with Dr. Carter on the continuum of steps for a research project such as this, from IRB approval to survey design, to training of enumerators and beyond.



Lessons Learned

This project has provided a variety insights into the process of coordinating such a wide range of research and implementation partners, which has at times proven challenging to coordinate in a timely manner.

In addition, the research has led to a rigorous investigation of how satellite data can best be used to develop an index that is highly correlated with average farmer outcomes, so that it can adequately predict farmer losses such that the insurance based on it would be both profitable for the insurance company and of high value to the farmer.

In addition, there have been equally significant discussions amongst the team to determine, once the index has been identified, how the contract can be best structured to

reflect the realtion faced by the dairy farmers on the ground in the study region. This has included discussions about measurement of grass vegetation areas vs. other types of cover, definition of the geographic scale of the index, a testing of different potential indices, and appropriate pricing of the final insurance product.

Moving forward, the research team will work with partners on the ground to ensure that the insurance product receives appropriate regulatory approval and is marketed as part of the experiment. As preliminary results emerge, researchers will appropriately interpret the results and translate them into policy briefs and recommendations.

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PROJECT REPORT: Tailoring Contract Farming to Smallholders in Kenya

This project will evaluate the potential of contract farming schemes to increase smallholder welfare, with additional experiments to test tailored insurance products and to examine ICT in the schemes.

The shift from subsistence to cash crops and from sales on spot markets to more complex contractual arrangements is often considered an important driver of structural transformation and growth. In the developing world, including Sub-Saharan Africa, contract farming is one of the most common contractual forms through which this transition occurs. The diffusion of such schemes has been steadily increasing over the last few decades.

This research results from a long-term partnership between the research team and Mumias Sugar Company (MSC), one of the largest private sector farming schemes in East Africa. This research will evaluate a suite of interventions to assess potential impact of such schemes along several dimensions, including farmer income, technology adoption and take-up of insurance products. First, the research team will have the rare opportunity to randomly vary participation in a contract farming scheme. In addition, they are exploring variations in the details of the contract offered to farmers in order to shed light on which features of the contract farming model drive impact.



Collaborations

Stanford University: *Lorenzo Casaburi (PI), John Shoven (Co-PI)*

Harvard University: *Michael Kremer (Co-PI), Jack Willis (Co-PI)*

Maseno University School of Business and Economics: *Alphonse Odondo (Co-PI)*

Other Collaborating Institutions: *Mumias Sugar Company (MSC) and Innovations for Poverty Action (IPA)*

Project Outputs

Working paper “Harnessing ICT for Development” (under revision)

Working paper “Time vs. State in Insurance” (under revision)

PEDL Policy Brief “Management Information Systems and Firm Performance: Experimental Evidence from a Large Agribusiness Company in Kenya” (under review)

JPAL brief “[Make it Rain](#)” Brief. February 2016.

For more information on this project, please see our [website](#).

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Achievements

The research team successfully administered a pilot study on the insurance product, which targeted about 1,000 farmers. The Principal Investigators have also produced a working paper, which they have been presenting in several international conferences. However, the full-scale evaluation has not yet been launched, due to the Mumias Sugar Company's financial problems.

Mumias has been experiencing cash-flow issues since 2015, which have been gradually improving since the appointment of a new CEO and new head of Agriculture in July and August 2015, respectively.

Although the financial troubles have limited the pace of

Capacity Building

Academic capacity building:

- Short course on program evaluation at Maseno University for doctoral students and faculty members from Western Kenyan universities
- Short course on field research methodology for master students from Western Kenyan University
- Mentoring and research funding for three graduate students (at least one woman) from Maseno University
- Provision of two degree scholarships for Masters students

Partner capacity building:

- Course on Data Management and Analysis for partner company staff
- Research funding provided to company staff research projects on challenges and innovations for sugarcane smallholders

Lessons Learned

The gains from insurance arise from a transfer of income across states. Yet, by requiring the payment to be paid upfront, standard insurance products also transfer income across time. Researchers have used results from this study to show that this intertemporal transfer may help explain low demand for insurance, especially among the poor, and used this randomized control trial in Kenya to test a crop insurance product which removes it.

The insurance product was interlinked with a contract farming scheme: as with other inputs for farming, the buyer of the crop offers the insurance and deducts the premium from farmer revenues at the time of harvest. The take-up rate under these altered conditions was 72 percent, vs. the

recruitment activities, the recruitment of new farmers is now a major focus of the company moving forward as it looks to regain the confidence of sugarcane farmers.

The research team and partners successfully piloted a hotline query-logging system and interactive SMS scheme. Both services were offered to about 8,000 farmers.

In addition, the research team conducted a randomized controlled trial with around 1,000 farmers contracted with the company. The company offered all these farmers a double-trigger area yield insurance product. Analysis of the results of this RCT are ongoing.



5 percent that is typically observed for standard contracts in which payment of the premium is required upfront. In fact, take-up is highest among poorer farmers.

From a policy perspective, boosting take-up of agricultural insurance is an on-going challenge. The results from this RCT indicate that changing the timing of premium payment represent a promising idea that warrants further investigation.

More investigation is needed to fully understand these results and their policy implications.

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PROJECT REPORT: Promoting Adoption of Improved Production Technologies Among Smallholders via Coupled Credit and Insurance

This study is testing the hypothesis that coupling index insurance with production loans that require indemnities to first be applied to outstanding loans will reduce defaults and increase access to credit.

Researchers have designed a study to rigorously test whether financial technologies that promote the adoption of improved production practices among smallholders by using index insurance to manage the default risk associated with agricultural production loans. The primary hypotheses are that:

1) Exposure of lenders to the risk of widespread loan defaults due to recurring droughts, floods, and other adverse systemic natural events either raise the interest rates charged on agricultural production loans or lead to more restrictive credit rationing, as a result undermining the adoption of improved, investment-intensive technologies among smallholders, and

2) Index insurance, properly designed and integrated into lender credit portfolio management and loan policies, can reduce the risk of widespread agricultural loan defaults (or their impact on lender losses) during adverse systemic natural events, allowing lenders to expand access to credit among smallholders and reduce the interest rates they charge on agricultural production loans.

Prior research predicts that access to index insurance [reduces household vulnerability to falling into poverty](#), and that households with access to coupled credit-insurance contracts are more likely to employ high-technology farming practices at lower levels of wealth than uninsured households or those without access to credit. As a result, households that are able to adopt and sustain adoption of higher-productivity technologies show higher long-run consumption rates than those of traditional technology households.



Collaborations

LEAD PI: Mario Miranda, The Ohio State University

CO-PI: Aboul Sam, The Ohio State University

CO-PI: Francis Mulangu, African Center for Economic Transformation (ACET), Ghana

This research project is receiving logistical support from the Ghana Agricultural Insurance Program (GAIP), an organization of 19 Ghanaian insurance companies. The research project will use GAIP's index insurance initiatives as laboratories for assessing the impact of index insurance on lending practices.

Project Outputs

The research team and collaborating partners, over the past year, generated seven internal project reports and documents, seven research manuscripts and working papers, and six presentations.

A complete list with full citations is available in the appendix of this report.

In addition, the AMA Innovation Lab has created a [brief](#) and a [thumbnail summary](#) for the project.

For more information on this project, please see our [website](#).

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Achievements

Project personnel completed the first control trial intervention, which involved the distribution of group loans to smallholders with the different index insurance treatments. Project personnel initiated the second control trial intervention, which will involve the distribution of group loans to smallholders with different index insurance treatments.

Project personnel also completed the midline survey during February 6 - March 27, 2016. A total of 778 farmers belonging to 258 farmer groups in the three northern regions of Ghana were surveyed. The research team validated and analyzed data, issuing a preliminary analysis of the midline data collected.

Capacity Building

Project personnel conducted a capacity building event on February 11-12, 2016 in Tamale, Ghana, for managers and loan officers of the Association of Rural Banks – Northern Chapter and managers and marketing agents of the Ghana Agricultural Insurance Programme (GAIP). The program was based on the “Business Process Map” developed by Miranda and Gallenstein.

A collaborator and Assistant Professor at Ohio State University conducted a one-week workshop on Behavioral and Experimental Economics in August 2016, in the University of Ghana PhD program in Applied Agricultural Economics and Policy.

Project Lead-PI Miranda continued mentoring Francis H. Kemeze, PhD candidate in Agricultural Economics and Agribusiness at the University of Ghana – Legon.

Lessons Learned

Given that the project is ongoing, many of the lessons learned have not yet been identified. The midline survey took place in February 2016, and the second trial took place through September 2016. As a result, it is difficult to identify any results or lessons learned from the information that has been collected to this point. Still, a few lessons may be extracted from the implementation to date.

Members of the research team met with bank members in February 2016, as described in “Capacity Building” section, above. Researchers noted that the bank representatives had good, clarifying questions, especially from the managers.

Researchers also noted that the meeting helped to

Project Lead PI Miranda and GRA Gallenstein developed a “Business Process Map” to coordinate activities of agricultural lenders and the Ghana Agricultural Insurance Programme (GAIP) in the provision of loans tied to index insurance.

In March 2016 the PI worked with the local research team to prepare for the second field intervention and the endline survey. The team also worked with GAIP to discuss plans for index insurance provision in the second intervention, including pricing and changes in marketing policies. He also met with mission and various USAID projects in Ghana.



establish a direct connection with the banks, and provided an excellent opportunity to clarify any lingering misconceptions about the project, the role of the research team, or how the insurance would work.

This meeting helped to demonstrate that, in a project like this that links insurance and credit, it is essential that both the insurance and banking partners understand how all parts of the project will work, and that they feel fully engaged and aware of all the relevant details.

At the end of the meeting, both the insurance partners and the banks agreed on a business process map.

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PROJECT REPORT: Disseminating Innovative Resources and Technologies to Smallholders (DIRTS) in Ghana

This research project will evaluate the impacts of an intervention designed to address multiple constraints to the pervasive problem of chronic underinvestment in input technologies and risk exposure.

In Ghana's Northern Region, smallholder farmers cultivate rain-fed crops, face significant risk of weather shocks, chronically underinvest in input technologies, achieve just a fraction of potential yields, maintain limited liquid savings, and may be food insecure.

This research project examines the barriers to smallholder farmer adoption of intensified cultivation practices and risk management tools, and measure the impact of three innovative, potentially scalable programs on farm productivity and profitability, consumption and food security, intra-household labor allocation, asset holdings and rural household resilience.

This project will use randomized controlled trial methodology to measure the impact of providing assured rural access to (a) improved information flows through Android-based extension applications, (2) improved-yield input technology packages at varying prices, and (3) commercial drought index insurance at varying prices.

DIRTS will be implemented with the Department of Food and Agriculture and rigorously evaluated.



Collaborations

Mathias Fosu PhD, Former Senior Research Scientist, Savanna Agricultural Research Institute

Dean Karlan PhD, Professor of Economics, Yale University

Shashidhara Kolavalli, Senior Research Fellow, International Food Policy Research Institute

Christopher Udry PhD, Henry J. Heinz II Professor of Economics, Yale University

Project Outputs

The DIRTS project has prepared and issued newsletters with basic programmatic information, produced and disseminated by partners at IPA quarterly.

At this point, until the endline surveys are completed, any publications to date are update related, and not published results-oriented materials.

For more information on this project, please see our [website](#).

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Achievements

Notification and payouts for the 2015 insurance product took place in May 2016, later than planned due to operational challenges. In addition, in recognition of the rain patterns from the last several years, the insurance partners have introduced a late maize insurance product that would cover farmers in case first germination fails and replanting is needed.

The “Batoro” radio drama program is a widely patronized night drama session hosted on public radio. The insurance partners booked two slots to advertise the policy through an audio drama, combined with phone-in discussions with the audience.

Capacity Building

Recruitment and training of survey field staff was carried out in January 2016. Training of Community Extension Agents (CEAs) was organized and took place in May 2016.

The method of extension message delivery to farmers changed from one-on-one meetings to group delivery. To aid in showing the previously used extension videos to farmers, the intervention has switched from use of tablets to significantly bigger displays to facilitate better viewing, with the use of TVs.

Selection of which videos to watch at each meeting will be determined by the administration of a modified version of the CEA diagnostic tool used in the past two years, allowing farmers to vote for the most relevant messages for a given week.

Lessons Learned

Data collected in 2015 suggests that the daily forecasts partially determine when households decide to plant. Households who receive notice via a forecast that it is likely to rain the next day are much less likely to plan today. The same pattern holds for households that are neighbors of those who receive forecasts, indicating that farmers not receiving the forecasts directly still change their planting timing in response to the forecasts, perhaps because the information is being shared within communities, or they observe and copy activities of the weather forecast recipients. Weekly forecasts also seem to significantly impact households planting decisions.

The research team has also conducted qualitative surveys

This current insurance coverage period will end on October 8, after which a payout calculator will be prepared to determine payouts based on the rainfall data received.

Insurance marketing was successfully completed with 1,801 policies sold.

Following a lack of response to the inputs marketing intervention both in terms of farm productivity and even agro-chemical inputs' use, a decision was made to discontinue this treatment in 2016.



of the CEA intervention from the perspective of the farmers. Almost all respondents lauded the intervention as valuable to their farming activities. While most of the farmers were convinced that the messages were useful, most could not quite instantly adopt all the recommended practices due to some constraints. Reasons for non-adoption centered mainly on funding and limited time for adoption of all content in each topic message delivered. It is possible also that though inputs were made available to farmers to purchase in various communities, farmers were still constrained in accessing the inputs because they had no previous savings and could not afford inputs at the prevailing market prices, or had no capital assets that they could readily sell.



RESEARCH THEME 4

IMPROVING MARKET ACCESS FOR INCLUSIVE GROWTH

Markets in developing countries are often plagued by poor integration. Smallholders often face isolation, which can have a major effect on both farmer incomes and food security. While poor infrastructure often gets the blame of poor market integration, other factors may play a role, as well. AMA Innovation Lab researchers are investigating both potential problems and solutions to the problems facing these markets.

Brian Dillon, University of Washington, "Communication, Search, and Mobile Phones: A Telephone Directory Intervention in Tanzania."

Craig McIntosh, University of California San Diego, "Building Market Linkages for Smallholder Farmers in Uganda."

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PROJECT REPORT: Demand & Supply Constraints to Improved Sorghum Technology Adoption & Their Gender-Differentiated Effects in Burkina Faso

Researchers are working with sorghum breeders and agro-input suppliers to compare alternative mechanisms to encourage adoption of improved seed and fertilizer micropacks.

Supply and demand constraints reduce the adoption of improved sorghum technology in the West African Sahel. Researchers are with implementation partners in Burkina Faso to compare alternative mechanisms to encourage the adoption of these technologies.

A demand side treatment will be targeted by social network characteristics to understand the information effects of farmer take-up and spillover based on social network characteristics from randomized distribution of micro-packs. A social network census will reveal the extent to which villages insure one another against idiosyncratic risk. The supply side of this randomized control trial will test whether consistent market supply, credit constraints and farmer commitment explain low adoption and potential supply side marketing mechanisms to increase adoption.

Researchers will also examine the gender dimensions of adoption of these technologies. The new technologies are time-consuming and laborious. If technology adoption diverts women's labor from their fields to sorghum fields, the household's dietary diversity and women's income may decline, as well as induce intrahousehold labor substitution among women and children. Women's bargaining power within the household may also be affected.



Collaborations

LEAD PI: Andrew Dillon, Michigan State University
CO-PI: Maria Porter, Michigan State University
CO-PI: Melinda Smale, Michigan State University
CO-PI: Isabelle Dabire, National Agricultural and Research Institute (Ouagadougou, Burkina Faso)
CO-PI: Souleymane Ouedraogo, National Agricultural and Research Institute
CO-PI: Adama Traore, National Agricultural and Research Institute
CO-PI: Estelle Plat, Innovations for Poverty Action (Burkina Faso)
CO-PI: Nicolo Tomaselli, Innovations for Poverty Action

Project Outputs

Researchers have produced non-print outputs over the first two years of the project including five datasets, a [project brief](#), and 10 stakeholder meetings to build support for the project and solicit feedback from stakeholders on the design of the project.

Researchers began data analysis for three working papers and presented preliminary results at the [2016 AAEA meetings in Boston](#) from one of these working papers.

For more information on this project, please see our [website](#).

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Achievements

In the first half of this past fiscal year, researchers were challenged by some data issues. Specifically, they discovered a number of issues with the social network census data and with merging various data files, particularly across survey waves. They have, however, worked with their partner Innovations for Poverty Action to clarify remaining questions.

Researchers have completed data cleaning of the follow-up and adoption surveys. The research team has preliminary results to inform three working papers, which they are working to finalize.

Capacity Building

In the past annual reporting period, the Michigan State University team has continued to engage with the Institut de l'Environnement et de Recherches Agricoles (INERA) research team to develop qualitative research on gender and sorghum technology adoption.

In addition to the substantial capacity building in which the Michigan State University research team has been engaged as part of their collaboration with their local partners, a graduate student was funded through the AMA Innovation Lab during the previous academic year. A second graduate student also worked on this project through funding from the Gates Foundation and will continue in the upcoming academic year.

The research team will continue capacity building - including through their dissemination work - in the coming year.

Lessons Learned

Researchers are currently analyzing data from the five surveys conducted and will present key findings and results at the dissemination workshop in Ouagadougou and the Mind the Gap Conference at for USAID and other relevant program developers, both in November 2016.

On the supply side treatments, researchers do have information from take-up rates across groups D (farmers were offered early commitment to purchase the improved packet at fixed market price), E (the late offer of the improved packet for purchase) and F (the late subsidized improved packet). The objective of these different treatment groups were to disentangle the effect

Dissemination activities were delayed due to the [bombing in Ouagadougou in January 2016](#) which caused us to extend the project to the middle of 2017 to ensure results are well-analyzed and distilled into appropriate materials effectively, without the pressure of an impending end date. The bombing limited travel and stakeholder meetings (including meetings with mission) during this time.

The research team is also seeking funding for follow-on work for a related random controlled trial to examine the extent individual farmer preferences are consistent across time and whether this influences take-up rates in the different experimental groups included in this study.



of the farmer's commitment problem due to liquidity constraints from that of the effect of price on adoption. To address two significant supply side adoption constraints, these interventions - price discounts and commitment mechanisms to enable farmers to purchase micro-packets at periods of time with lower liquidity constraints - were offered.

Take-up in group D (early commitment) was much greater than the take-up in groups E and F, (both late commitment) consistent with previous work in this area. This is consistent with [previous work in Kenya by Duflo et al. \(2011\)](#).

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PROJECT REPORT: Building Market Linkages for Smallholder Farmers in Uganda

This project aims to combine market linkage services with high-frequency data collection, an innovative digital trading platform, and a set of contractual guarantees to offer solutions for market deepening.

In the face of growing food demand from a burgeoning population, East African agricultural markets are plagued by poor integration. The symptoms of shallow markets can be seen across space (leading to highly volatile prices) as well as across time (leading to prices that tend to be low when farmers are selling and high when they are buying). Given the inability of markets to efficiently move food from surplus to deficit regions, this poor integration has a major effect on both farmer incomes and on food security. The mostly likely causes for this limited market integration are imperfect information and contractual uncertainty, which lead to high search costs and large information rents for intermediaries.

Solving these problems has proven challenging. Several studies have provided price information to farmers, but without the means to provide their own transportation to alternate markets, farmers are unable to take advantage of the information. Without changing the structure of market intermediation, these interventions appear to be ineffective at improving farmer income. Improving farmer welfare and stimulating greater market integration, then, appears to require strategies that fundamentally shift the nature of intermediary relationships and the degree of contractual uncertainty.

Researchers propose a multi-pronged intervention that aims to address these research questions and build sustainable, private-sector solutions to some of the intermediation issues that have plagued African food markets. Three prongs of the study work to simultaneously alter the intermediaries, the information, and the contracting options available in food markets. First, researchers teamed with AgriNet, a major private-sector supply chain company, to implement an expansion of their Commission Agents model. Second, they are working with IPA to implement a high-frequency market price survey that then feeds market prices back to farmers and traders in the area - all via SMS. Third, researchers have built a close relationship with Kudu, a digital food trading platform that allows farmer groups to contract directly with major buyers.



Collaborations

LEAD PI: Craig McIntosh, University of California San Diego (UCSD)

CO-PI: Lauren Falcao, University of California Berkeley

CO-PI: Richard Ssekibuule, Makerere University

This research project is also collaborating with Innovations for Poverty Action (IPA) in Uganda.

Project Outputs

[Presentation](#) at Google San Francisco, CEGA's Evidence to Action Event on Financial Inclusion. May 5th, 2016.

Software platform for implementing SMS-based surveys of market traders.

["Using Innovative Mobile Technology to Bridge Market Gaps."](#) AMA Innovation Lab Spotlight. 2016.

For more information on this project, please see our [website](#).

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Achievements

Before the launch of Kudu, AgriNet focused on populating the Kudu system by registering their Commission Agents (CAs) and recruiting buyers, while in the meantime Kudu worked on finalizing the study's requirements for its system. By early August 2015, the full intervention and first season was launched in all eleven study districts.

To oversee any deals created by the intervention, four Deal Coordinators (DCs) were hired to help handle the activity on Kudu. In addition to Kudu's automatic matches, the DCs matched buyers and sellers manually by presenting attractive asks from sellers to buyers. A collaborate online system was developed to help the DCs make manual matches, track all bids and asks, follow-up on Kudu matches, assign randomized guarantees, and record/collect data. This has allowed the various members of the team, often located in different parts of the country, to

collaborate in real time and have a better overview of what is taking place at any given moment.

The second season started in December 2015 and saw an encouraging increase in activity on the Kudu system with, from the beginning of January, close to 1800 bids and asks having passed through the system and 347 automatic "matches" taking place – meaning that the price, quantity and crop were within set parameters. By the start of the third season the project had received over 3,000 asks and bids through the Kudu system as well as 1,410 matches, of which 486 were automatically matched by Kudu. And by the end of August 2016, two months into the third season, the project had already received 2,531 asks and 2,888 bids through the Kudu system as well as 2,574 matches, of which 552 were automatically matched by Kudu and 303 actual trades have taken place as a result.

Capacity Building

Much of the capacity building in this project has been integrated into the intervention's implementation. In particular, the call center which allows buyers to directly reach out for support and gain additional information has built their capacity and improved user engagement at a relatively low cost.

Training of the staffing for the various parts of this multi-pronged intervention has also been ongoing, including meetings with Commission Agents, trading center meetings, and other program components.

Before farmer recruitment, Commission Agents were given refresher training on their roles and responsibilities.

Lessons Learned

Kudu has experienced increased traffic and success by improving its platform. The SMS format they used before was error-prone, limited the ability to create interactive relationships with users and lacks a location selection mechanism for first-time users. Kudu therefore focused on getting the new system ready, which was launched in the third season and has been successful to date.

The project's call center replaced its temporary callers with longer term callers in order to provide continuity and the possibility of calling CAs and buyers to promote uptake of the intervention. The call center calls buyers and sellers to register any new users on the system, post any asks or bids for the buyer or seller on Kudu, and remind

them about the guarantees, COB, discounts, and bonuses.

As part of the call center, a hotline was launched. The phone number was included in any messages sent out to buyers and CAs to give them the opportunity to call for support when needed. Due to the increased activity on Kudu throughout the seasons and after seeing the positive effect the direct user engagement had through calls compared to the relatively low cost, the call center was expanded to a total of 15 phone operators and the entire project team moved to a new office space in the same building as AgriNet, allowing the Deal Coordinators to work more closely with the phone operators of the call center.





RESEARCH THEME 5

NATURAL RESOURCE MANAGEMENT

Improved natural resource management in developing countries promotes food security and environmental sustainability. Despite increasing evidence that improved natural resource management can lead to better economic outcomes and higher quality of life for participants in developing countries, many programs promoting such practices still face low uptake rates. The AMA Innovation Lab now supports projects investigating mechanisms to improve natural resource management among smallholder farmers.

Andrew Bell, New York University, "Smart Subsidies to Promote Peer Monitoring of Conservation Agriculture Compliance in Malawi"

Yaniv Stopnitzky, University of San Francisco, "Rural Livelihoods and Institutional Reform in Small-Scale Fisheries in Tanzania"

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PROJECT REPORT: Smart Subsidies to Promote Peer Monitoring of Conservation Agriculture Compliance

Researchers are evaluating an incentive intervention to provide an understanding of the role interactions play in reducing monitoring costs and improving program effectiveness in Malawi.

Conservation Agriculture (CA) in developing countries has the potential to promote food security and improve the environment. Adoption of CA techniques, however, has been disappointing in many developing countries. This is perhaps due to inadequately designed CA policies and insufficient economic incentives to overcome the barriers to adoption. Current evidence suggests that adoption of CA increases with interventions that facilitate the transfer of experiential learning between farmers. In addition, institutions which create interdependence between farmers' economic decisions (and use social capital) have led to increased adoption and compliance with CA.

This research will evaluate the impact of an agglomeration bonus incentive scheme on compliance to CA in Malawi's Shire Valley basin. The agglomeration payments have two parts: a flat subsidy that induces landowners to voluntarily participate in the CA program and an agglomeration bonus paid to landowners when their land enrolled in the CA program shares a common border with a neighboring parcel also enrolled in the CA program. By evaluating the impact of agglomeration payments on adoption of CA techniques, under different conditions of compliance monitoring, researchers hope to provide an understanding of the role that social pressures and interactions play in reducing monitoring costs and improving program effectiveness.



Collaborations

LEAD PI: Andrew Bell, IFPRI, New York University
CO-PI: Patrick Ward, IFPRI
CO-PI: Lawrence Mapemba, Lilongwe University
CO-PI: Tim Benton, University of Leeds

This work is being conducted in partnership with the Malawi Department of Land Resources and Conservation and the National Smallholder Farmers' Association of Malawi. It leverages funding from International Food Policy Research Institute (IFPRI), as well.

Project Outputs

This year the research team published three academic papers (full citations available in the appendix to this report).

The team has produced analysis of the first year adoption data, which is currently under review. This analysis has been published as an [IFPRI discussion paper](#).

The project also has an associated "[thumbnail](#)" document, produced by the AMA Innovation Lab.

For more information on this project, please see our [website](#).

2016 Assets & Market Access Innovation Lab Annual Report

Achievements

The primary activities this year have been the following:

- 1) Year two registration, monitoring and aerial survey activities;
- 2) Capacity building workshops in Lilongwe and Blantyre;
- 3) Ethnographic Decision-Tree Modeling work; and
- 4) Endline survey activities (currently underway).

The second year of the intervention went largely as planned. There were nearly twice as many participants as year one. The researchers hope to acquire additional support to continue a third year.

Capacity Building

Researchers conducted two three-day workshops in Lilongwe and Blantyre on improved rural data collection.

The workshops included curricula on the following:

- i) impact evaluation,
- ii) data analysis in Excel,
- iii) data collection using Android ODK,
- iv) spatial analysis using QGIS, and
- v) choice modeling using R.

Researchers had approximately 100 participants across both workshops, with participants from universities, NGOs, government, and the private sector.

Researchers also collected evaluations based on these trainings to inform future efforts.

Lessons Learned

Researchers observed a doubling of program participation (from 1,450 participants enrolled in the scheme to 2,870) from year one to year two. The analysis has not yet begun on compliance among registrants and patterns in that compliance.

Creation of final datasets (EDTM dataset and endline dataset) is underway at present. Efforts over the last year have been focused on capacity building and field work rather than compilation of datasets.

As stated above in "Achievements" section, researchers are hoping to find another local partner willing to fund an additional (third) year of activities. The research team is

Aerial survey work has gone largely as planned, though due to the high levels of wind observed, and some unpassable roads, work took longer than planned and there are some gaps in coverage.

Ethnographic work was led by partner NASFAM and the field dataset (summary of completed interviews and key decision criteria) has recently been submitted to the research team. They have not undertaken analysis or model development, but did draw the set of elicited key criteria and incorporate them into our endline survey.

Thus, the model developed with the base dataset will be validated using the large (1,800 participant) endline survey.



hoping to take advantage of an unpredictable opportunity that has arisen based on recent weather patterns.

The unique window provided by the 2015 - 2016 drought year and expected 2016 - 2017 wet year to observe the impact these contrasting conditions may have on adoption of conservation agriculture techniques, as well as to observe any potential impacts on compliance to the techniques.

At this point, however, no funding for a third year has been identified.

2016 Assets & Market Access Innovation Lab Annual Report

PROJECT REPORT: Rural Livelihoods and Institutional Reform in Small-Scale Fisheries in Tanzania

Researchers in Tanzania are testing a novel approach to improving institutional performance by playing repeated experimental games with fisherman, to see if it translates into increased cooperation.

Despite the importance of institutions in shaping development outcomes, research focused on understanding how institutions emerge, adapt, and change is still in its infancy. With command-and-control approaches to fisheries management largely being recognized as ineffective for small-scale fisheries in developing countries, understanding the mechanisms that foster the development of strong local institutions for small-scale fisheries management is of critical importance. This is especially true given that a bottoms-up approach to managing small scale fisheries in developing countries is not guaranteed to succeed. Indeed, the extent to which strong institutions develop from a bottoms-up approach depends on the ability of fishery users to collectively govern the fishery resource in a manner that resolve externalities and internal coordination tasks efficiently, fairly, and with low transactions costs.

We propose to test a novel approach to improving institutional performance. Numerous laboratory and field experiments have demonstrated that individuals gain experience when playing repeated experimental games, which then alters their patterns of coordination and cooperation. For example, a number of studies find that cooperation emerges in infinitely repeated coordination game, and that observed levels of cooperation are higher than in finite games. Such findings suggest that players process information about the game as they play, which they then incorporate into their game-based behavior. In many cases, this experience translates into increased cooperation in similarly structured games. These studies make clear that experimental games can therefore help make more salient strategic and behavioral considerations that affect how individuals participate in these games during future play.



Collaborations

Matthew Reimer

Assistant Professor of Economics
University of Alaska-Anchorage

Yaniv Stopnitzky

Assistant Professor of Economics
University of San Francisco

Paul Onyango

Lecturer (Assistant Professor)
Department of Aquatic Sciences & Fisheries
University of Dar Es Salaam

Project Outputs

The research team has just begun to clean and analyze the data from this second round of fieldwork, so are unable to report yet on findings. The research team is continuing to work on drafting the results and analysis from this research into academic papers, after which other dissemination materials - including presentations and policy briefs - will be put together.

In addition, the research team will use the results from this “seed” research to attempt to leverage additional funding for follow-up research.

For more information on this project, please see our [website](#).

Achievements

In the summer of 2015, the research team began actively preparing project implementation plans for field research during August. They modified the experimental design and survey instrument to try to generate evidence regarding whether or not participation in experimental games would foster cooperation, monitoring, punishment, or other improved behaviors in the real world.

In this phase of the experiment, the research team sampled 26 fishing villages on the eastern side of Lake Victoria (Magu in Mwanza region, Busega in Simiyu region, and Musoma and Rorya districts in Mara region). In these villages, the research team implemented their game and survey with 335 fishers, and they additionally surveyed 467

fishers who had been assigned randomly to the control. Results from this additional phase of the study continue to be examined and interpreted.

This award was technically completed December 31, 2015. As such, very few activities took place during this federal fiscal year. The primary activities conducted in this year involved the analysis and interpretation of the data, and putting the results together into dissemination materials, including academic research papers, policy briefs, and presentations.

Capacity Building

This project, given its limited scope as a seed activity, did not conduct any traditional capacity building activities.

That said, the research team did do some capacity building as a tangential activity, intended to standardize the enumerators for the surveys in this research activity.

The survey team was comprised of graduate students from Tanzania and the United States, as well as local researchers from a fisheries research institute near Lake Victoria.

In this sense, while the setting was not primarily intended for teaching or imparting knowledge, these activities of course built survey skills for the ten individuals involved.



Lessons Learned

Initial analysis after the first round of experiments displayed some counterintuitive (and interesting) results: that there are actually relatively few instances of illegal use in the games, and fisherman are more likely to fish exploitatively in games with enforceable punishment. In face, the evidence from these games suggested that institutions that impose enforcement along one dimension (cheating behavior) may cause a substitution into more individualistic behavior along other margins (i.e. harvest rates).

As described above, the research team altered the game in the second round of experiments in 2015 to try to learn more about whether or not participating in an experimental game that focused attention on critical

aspects of how individuals affect the performance of a fishery would foster cooperation, monitoring, punishment, or other improved behaviors in the real world. The data from this second round of experiments took some time to analyze and interpret.

Even though the project formally concluded on December 31, 2015, they are continuing to work on writing up and disseminating the results and their interpretations, especially with regard to potential policy implications. They also have greater clarity with regard to the overall concept being tested and how to test it, which will help as they seek additional support for a larger-scale, longer-duration test of their hypothesis.



RESEARCH THEME 6

SOCIAL SAFETY NETS & PRODUCTIVE ASSET TRANSFERS

Social protection programs have been widely considered a promising solution for persistent poverty. Productive asset transfers are a particularly popular form of social protection for vulnerable populations, often supplemented with trainings for human or social capital development.

Nicholas Magnan, University of Georgia, "Evaluation of the Welfare Impacts of a Livestock Transfer Program in Nepal"

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PROJECT REPORT: Evaluation of the Welfare Impacts of a Livestock Transfer Program in Nepal

This research will test the impact of a program by Heifer International that seeks to improve the productive capacity of households through the provision of physical, human, or social capital (or all three).

Social protection policies and programs have been widely heralded as important for addressing persistent poverty, with the aim to enhance the capacity of poor and vulnerable populations to manage economic and social risk. These interventions often include a cash or asset transfer, as well as programs to develop human or social capital. This project seeks to disentangle the importance of physical assets relative to human and social capital by analyzing the different facets of [Heifer International's program for the chronically poor in Nepal](#).

Heifer is widely recognized as a global leader among organizations providing these types of interventions. The basic Heifer program transfers improved livestock to poor and marginalized beneficiaries to increase the resilience of recipient households and increasing consumption and investment in nutrition. Perhaps less known is Heifer's emphasis on providing human and social capital through a series of trainings and, more recently, through facilitation of independent savings group formation. The program also calls for beneficiaries to "pass on the gift" by transferring the offspring of granted goats to a new cohort, and sharing the training with them.

The ultimate aim of this project is to learn more about how asset and human capital transfers can be used to improve the livelihoods of the rural poor in Nepal and beyond. This research will improve existing asset transfer programs, as well as contribute to the debate of what works best, and under what conditions, if any.



Collaborations

LEAD PI: Nicholas Magnan, University of Georgia

CO-PI: Sarah Janzen, Montana State University

CO-PI: Ruth Meinzen-Dick, IFPRI

CO-PI: Ranjendra Pradhan, Nepa School for Social Sciences and Humanities

CO-PI: Sudhindra Sharma, Nepa School for Social Sciences and Humanities

With implementation support from Heifer International:
Neena Joshi (Senior Program Manager, Nepal Heifer International) and Rienzi Kern (Senior Director of Planning, Monitoring, and Evaluation, Heifer International)

Project Outputs

- Working paper (submitted for publication in peer-reviewed journal): "[Social Drivers of Aspirations Formation and Failure in Rural Nepal](#)"
- Qualitative draft report on women's empowerment
- Qualitative draft report on social capital, "Social capital in groups and beyond groups: A study of Heifer groups in Dhading, Mahottari, Nawalparasi and Palpa"
- Qualitative draft report on migration, focusing on the social impacts of male migration especially on women
- Qualitative draft report: "Evaluation of Heifer's Impact: Assets, Social Capital and Empowerment"

For more information on this project, please see our [website](#).

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Achievements

In January 2016, the research team was approached by Heifer International to help them evaluate their [post-earthquake](#) aid projects in both the research areas and in non-research areas. The team proposed an experiment in which they can compare resilience between typical Heifer beneficiaries (in the study areas), typical Heifer beneficiaries with access to an interest-free “revolving fund” loan post-quake (in non-study areas), and non-Heifer beneficiaries.

The first follow-up survey took place in May-June 2016. This reflects a slight delay do to political unrest and the fuel embargo. It included a new survey module on coping with the earthquake, intensity of the earthquake, access to aid, and intensity of the embargo. Analyses of aspirations

Capacity Building

Together, this diverse research team is working together with implementation staff to conduct this impact evaluation.

A major avenue through which capacity building is taking place is through workshops at the Nepa School of Sciences and Humanities. Participants include school scientists, students, Heifer employees, and other stakeholders. Workshop curricula include research methodology, proposal writing, and article writing. Capacity is also being improved through the collaborative research project itself.

Several students are also being trained through this project, at the University of Georgia and at Montana State University. Their involvement in the project is an important contribution to their individual training in these academic programs.

Lessons Learned

One of the potential impacts of interest to the research team and to Heifer partners is the relative impact of assets compared to human and social capital development on aspirations. The research team is using a composite index summing across several dimensions of aspirations previously developed in the relevant aspirations literature.

Their research asks two questions:

1. What are the social drivers of aspirations formation?
2. How do aspirations influence future-oriented behavior?

Their analysis to date demonstrates that the readily observable characteristics of one’s peers are important in

formation and failure has been improved, and a working paper has been drafted and submitted for publication.

In addition, the research team began preliminary impact analysis of the Heifer intervention and is working on the continued research plan in light of the changes detailed above.

The research team has also assembled draft reports on women’s empowerment, social capital, migration, impact of Heifer project, and property rights. Translated village histories have been completed for qualitative analysis in four research sites, with over five hundred pages of research notes ready to be reviewed.



forming aspirations for incomes and children’s education. These socially-driven aspirations drive future-oriented economic behavior. Investment in the future increases with aspirations to a certain point, but if the gap between one’s current status and aspirations becomes too large, investment subsequently declines.

Together these findings provide evidence that socially-driven aspirations may be an important driver of persistent poverty.

Additional analysis of the other welfare implications of the intervention is still to be conducted and those results are forthcoming.

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ASSOCIATE AWARD UPDATE: Advancing Index Insurance by Closing the Knowledge Gap

Background and Context

Decades of research have documented the high costs of uninsured risks for smallholder agricultural and pastoralist households. Risk makes people poor, leading them to shy away from high-return but high-risk opportunities. Risk keeps people poor when it leads them to pursue defensive savings strategies that cut off pathways out of poverty. Index insurance has proven a financial tool to transfer debilitating risk out of low-income rural households. Many modestly-scaled projects have substantiated that index insurance can have real development impacts. These results have garnered significant attention at the highest policy levels, and while this infusion of political commitment to the insurance agenda is an exciting opportunity, **there are still many barriers and technical challenges to realizing the full potential of index insurance and responsibly scaling it up.**

Through this award, the AMA Innovation Lab will capitalize on past efforts and - in cooperation with other global partners - help guide this political momentum towards **responsible and reliable index insurance solutions**, and to **close the gap that often exists between knowledge generation and large-scale project**

Primary Activities Under This Award

Establish and coordinate a **COMMUNITY OF EXPERTS** that will serve as a **GLOBAL ACTION NETWORK** that discusses key issues around agricultural insurance.

BUILD CAPACITY of practitioners and governments in focus countries; develop and conduct training for practitioners to create an enabling environment for agricultural insurance.

PROMOTE RESPONSIBLE SCALING of agricultural insurance to the broader insurance community; repackaging & disseminating lessons into knowledge products, tools, and training modules.

IDENTIFY REMAINING KNOWLEDGE GAPS on index insurance and work commission needed research and pilot activities.

Contribute to the **DESIGN, IMPLEMENTATION, AND EVALUATION** of one or more large-scale index insurance programs.

Partners

- Chris Barrett (Cornell University): “Assessing the Value of Index Insurance for Herders: Comparing NDVI-Based Insurance Products”
- Michael Carter (University of California Davis) and Andrew Mude (International Livestock Research Institute): “Can Integrated Safety & Cargo Nets Alter Poverty Dynamics in Northern Kenya?”
- Craig Churchill (International Labour Organization): “Convene Global Expertise through the Global Action Network Secretariat”

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Progress & Achievements

WORKING GROUPS

At the meeting of the Global Action Network and its working groups in Geneva in May 2016, draft documents for each of the work streams (highlighted in the boxes to the right) were presented, and feedback gathered from the larger group of experts. The comments from these meetings are being incorporated into new drafts of the documents now, and these tools for index insurance advancement are expected to be available early next year.

PEER-TO-PEER LEARNING

Despite the promise of index insurance to increase productivity and improve resilience, quality scaling of this innovative development tool is hampered by lack of strategic involvement of governments in developing countries. Governments have a critical role to play in advancing responsible index insurance, through interventions such as subsidies, investments in data infrastructure, leveraging government extension services, education campaigns, regulations, and consumer protection policies, among others.

We plan to leverage the tools created under this associate award to build the capacity of government and their partners through a peer-to-peer knowledge sharing network. We will work in roughly a dozen countries that are positioned to take advantage of the opportunities of index insurance. On May 4, 2016, the ILO hosted a half-day symposium on making agricultural insurance work, focusing on the role of governments in stimulating the development of agricultural insurance. There has also been a similar series of webinars.

IMPACT EVALUATION

Many index insurance projects have operated a modest scale with demonstrated development impacts. In some of the countries that have been investigated, conditions are promising to develop and scale-up insurance solutions as part of a disaster resilience solution. High priorities for those countries are to use insurance as part of an integrated social safety net program.

In 2016, AMA Innovation Lab researchers developed a proposal to conduct a rigorous impact evaluation of a scale-up of index insurance in Kenya that combines this risk management tool with a social safety net program. The proposal is currently being externally reviewed, and the board will vote on whether to fund in November 2016. If approved, work will begin quickly.

Coming Up in 2017

In 2017, work on all of the above projects will continue as planned. GAN working groups will have final versions of the tools they are creating (one for each working stream described to the right), the overall GAN network of experts will have their final meeting, and peer-to-peer learning will continue (including training on the three tools developed). If approved, the impact evaluation of the scale-up of index insurance in Kenya will commence work.

In addition, promotion and dissemination of the tools created will begin in earnest when they are finalized. To successfully and effectively advance the responsible scaling of index insurance, these tools must be readily available and well-understood amongst the community of actors integral to achieving these goals.



GAN'S THREE WORK STREAMS

Client Value

1

Little is done to assess the value of different products in practice. Developing an assessment tool allows us to compare different products and determine which perform better, which can be improved upon, and whether they are designed to actually offer at least a safe minimum level of protection.

Consumer Education

2

Despite increasing availability and proven benefits of index insurance in recent years, uptake remains low. Target populations often are unfamiliar with insurance and have low levels of education. We are developing guidelines for effective education of these products, including case studies.

Bundling

3

Insurance is just one part of the agricultural value chain, and offering it as a standalone product can be difficult to commercialize. Bundling insurance with other financial or non-financial services may be more effective, but it must be done effectively and responsibly in order to be successful and scalable.

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ASSOCIATE AWARD UPDATE: Achieving Development Impact with Complementary Seed & Financial Technologies

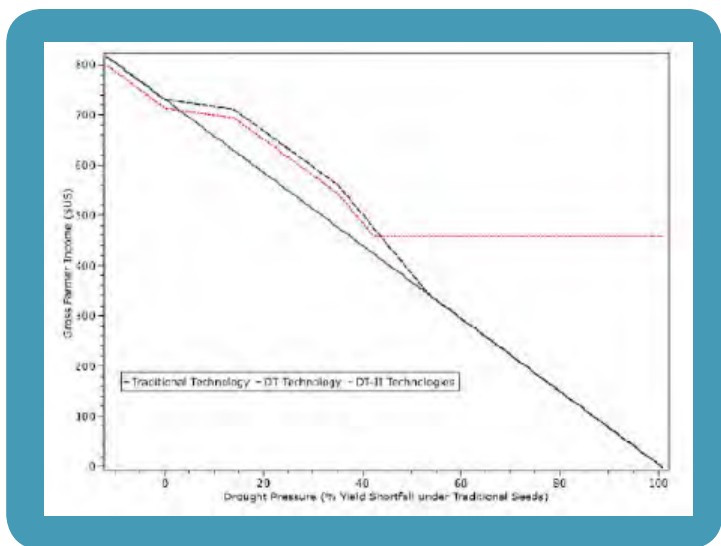
Background and Context

Recent years have seen the separate development of two technologies to help small-scale farmers manage climatic stress. The first technology is **seed varieties that better withstand climatic stresses like droughts and floods**. The second is the financial technology of **index insurance**, which transfers risk out of small-scale farming systems by issuing compensatory payments when climatic events occur and agricultural production collapses. These two technologies work in a similar way, but some important differences create a potential complementarity between the two.

Both technologies are designed to **stabilize producer incomes in the wake of an adverse event**, yet they have important differences. Most importantly, stress-resistant seeds tend to fail under extremely adverse events, whereas index insurance does not. For example, the floor resistant rice varieties can survive up to 17 days of flood-induced submergence, but beyond 17 days die and yield nothing (just like conventional rice varieties). While insurance payments generally increase as stress conditions become more severe, protecting against moderate stress with insurance can be very expensive - and this moderate stress protection may be more cost effective provided by stress-resistant seeds. This creates a **natural complementarity between the seed and financial technologies**. While much work to date on each of these technologies individually is encouraging, it has not explored their complementarities.

Insurance Steps Up When Seeds Fail

The solid green 45-degree line in the figure to the right graphs farmer income as a function of the yield shortfall under the traditional technology, and thus represents a benchmark prior to the introduction of these new technologies. The dashed blue line displays the expected impact of introducing improved seed varieties, which offer powerful protection against moderate drought risk, then fail. As drought pressure increases, improved seed varieties begin to fail and yields drop, reaching a “red zone” of failure. The dotted red line displays how a “red zone” insurance contract would kick in and stabilize farmer income when yield shortfalls reach the level improved seeds lose their ability to protect the farmer. **Under this combined mechanism, farmer income never falls below this minimum level of protection, no matter how severe the drought pressure becomes.**



Partners

- CIMMYT
- Tanzania Ministry of Agriculture (National Agricultural Research Institute System and the District Agricultural and Irrigation Commission)
- International Fertilizer Development Center

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Progress & Achievements

This project is still early in the implementation phase. The primary achievements from the past year lay the groundwork for future achievements. Specifically, the project formed the relationships with seed companies in both Tanzania and Mozambique. They also have begun promotion of the products that make up this intervention. In order to calibrate the insurance product to local on-the-ground conditions, the research team had to conduct surveys to acquire more information. They trained the enumerators and collected yield recall data and drought perceptions data to calibrate the product.

With regard to the impact evaluation, the research team designed the baseline survey, trained the local enumerators on digital data collection, and conducted the survey across all experimental and control districts.

In Mozambique, civil unrest forced the research team to change two of the three districts. As a result of this, the research team had to identify and work with two new districts which had not been originally anticipated either in the timeline or in the budget. The research team, however, is optimistic that this will not pose any major threat to the success of the project unless the instability worsens.



Coming Up in 2017

As described to the right, the research team will finalize insurance contracting with insurance partners in both Tanzania and Mozambique (UAP and Hollard). In addition, they will begin to work with implementation partners to promote the bundled financial and agricultural technologies in both countries. The team, along with partners, will monitor the insurance and weather outcomes.

With regard to the impact evaluation, researchers will prepare the midline survey, and then train enumerators in digital data collection for the midline survey. The team will also continue analysis of the data which has been collected so far.

Satellite Index

In recent years, the AMA Innovation Lab has taken a deep dive into the use of **sophisticated satellite measures** (such as evapotranspiration, gross primary production, green leafy area indices, and others) to predict crop yields. We will test these myriad indices in our research areas to determine the most effective index for insurance.

Audit Rule

The audit rule serves as a fail-safe for the contract. If farmers on the ground feel they had an extreme loss and the insurance index doesn't trigger payouts, they can petition for an audit through a crop-cutting. If the crop-cutting indicates an insurable loss, the payout will be triggered. This reduces the risk that there will be a loss but no payout.

Insurance Partners

In this project, the research team will work with **local insurance companies** to market and sell this financial innovation.

Partners are still being identified in both Mozambique and Tanzania. The research team should have partners by this annual reporting in 2017.

Seed Partners

In this project, CIMMYT will work with **local seed companies** to identify and purchase the seeds.

In Mozambique, the research project will work with two seed companies: Klein Karoo and Phoenix. In Tanzania, the project will work with three seed companies: Iffa Seed Company, Meru Agro, and Suba Agro and Technology.

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HUMAN & INSTITUTIONAL CAPACITY DEVELOPMENT

AMA Innovation Lab Approach to HICD

The Assets & Market Access Innovation Lab was designed and structured such that its most **durable and dynamic impacts** on the capacity of individuals comes through the collaborative research process. As a research program, the Lab's primary objective is to fund high-quality, policy-relevant research. However, as a condition of the any award, the Lab requires selected research teams to conduct capacity development activities, using their knowledge of the needs of their collaborating institutions. By working through United States research universities and requiring substantive partnerships with in-country research collaborators, the AMA Innovation Lab structure, through its affiliated researchers, co-produces training, mentorship, and capacity building as part of the research process.



The collaborative relationship between US and host country researchers can form a true intellectual partnership that can result in **tremendous and long-lasting gains**, not only to the host country PI, but also to the future generations of students that the PI may train. The BASIS AMA Innovation Lab looks explicitly for this kind of intellectual partnership in review of research proposals, striving to select research teams that have a strong relationship that substantively involve the host country researchers and their home institutions.

CASE STUDY: One Institution, Many Approaches *The Ohio State University*

STUDENT MENTORSHIP

Lead research Mario Miranda continued his mentorship of Francis H. Kemeze, a PhD candidate in Agricultural Economics and Agribusiness at the University of Ghana – Legon.

Francis has been working closely with the Project over the past two years, including serving as a field supervisor on the project's baseline and midline surveys, and is deriving his doctoral dissertation in part from these activities.

In 2016 alone, the Ohio State University, an AMA Innovation Lab collaborator, engaged in HICD activities in a wide variety of ways that demonstrate the multi-faceted approach possible through the AMA Innovation Lab Structure. Here we highlight three of OSU's capacity building activities from the past year.

SHORT COURSES

A project collaborator at OSU conducted a one-week workshop on Behavioral and Experimental Economics during August 8-12, 2016, in the University of Ghana PhD program in Applied Agricultural Economics and Policy.

IMPLEMENTER TRAINING

OSU researchers and partners conducted a capacity building event in February 2016 in Tamale, Ghana, for implementation partners. This training included managers and loan officers of the Association of Rural Banks and managers and marketing agents of the Ghana Agricultural Insurance Programme (GAIP). The program was based on the "Business Process Map" developed by the research team, and was led by a graduate student on the project with oversight by the host-country research lead.

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Short-Term Training

Per our case study of the Ohio State University on the previous page, AMA Innovation Lab supported research conducts short-term training in two primary ways: 1) short courses in economics, statistics, or a related field for partner institutions, and 2) training for implementation partners on the project activities. These two kinds of short-term training work to ensure both that the research capacity of the host institution (and the country) are enhanced to continue to conduct this kind of research after the project ends, and that the host country implementation partners can continue to implement the project after the project ends. In addition, the project being evaluated often itself has a training component as a key part of the intervention. These numbers are also included in “short-term training”, below.

Short-Term Training			
Country	Male	Female	Unknown
Bangladesh	80	20	0
Burkina Faso	3534	884	4418
Ghana	1236	1202	38
Kenya	0	0	330
Malawi	0	0	24
Nepal	35	25	0
Tanzania	1	1	675
Uganda	1123	3012	0
Total	6009	5144	5485



Long-Term Training

Most AMA Innovation Lab research activities utilize the talent of long-term students at United States universities in their home departments to provide substantive assistance in the implementation of research activities. By actively engaging students in their departments to work on their awards, the researchers develop the students' capacity through application of their skills in real life, hands-on field experiences. In addition, students at host country institutions often engage in the project activities in their country, including engaging on project collaboration and research implementation.

These students have student status at a university, but are conducting essential activities in their work on the project, for which the project would have to hire additional staff if the students were not involved. As such, the “training” component is secondary to the primary purpose of helping to conduct research activities. Because of their enrollment in a long-term academic program, however, we include these students who are working for the project under “long-term training”.

Long-Term Training			
Country	Male	Female	Unknown
Ghana	1632	1625	17
Kenya	2	0	1
Nepal	1	1	0
Tanzania	0	1	0
Uganda	193	29	0
Total	1828	1656	18

Institutional Development

The AMA Innovation Lab model also creates the prospect for institutional capacity building. Through the contracting process between US-based institutions and developing country institutions, these host country partner organizations gain valuable experience in award and contract management, especially with federal funding. These institutions can leverage this experience and demonstrated ability to accept and responsibly manage funds from international sources to try to secure additional funds from other sources in the future.

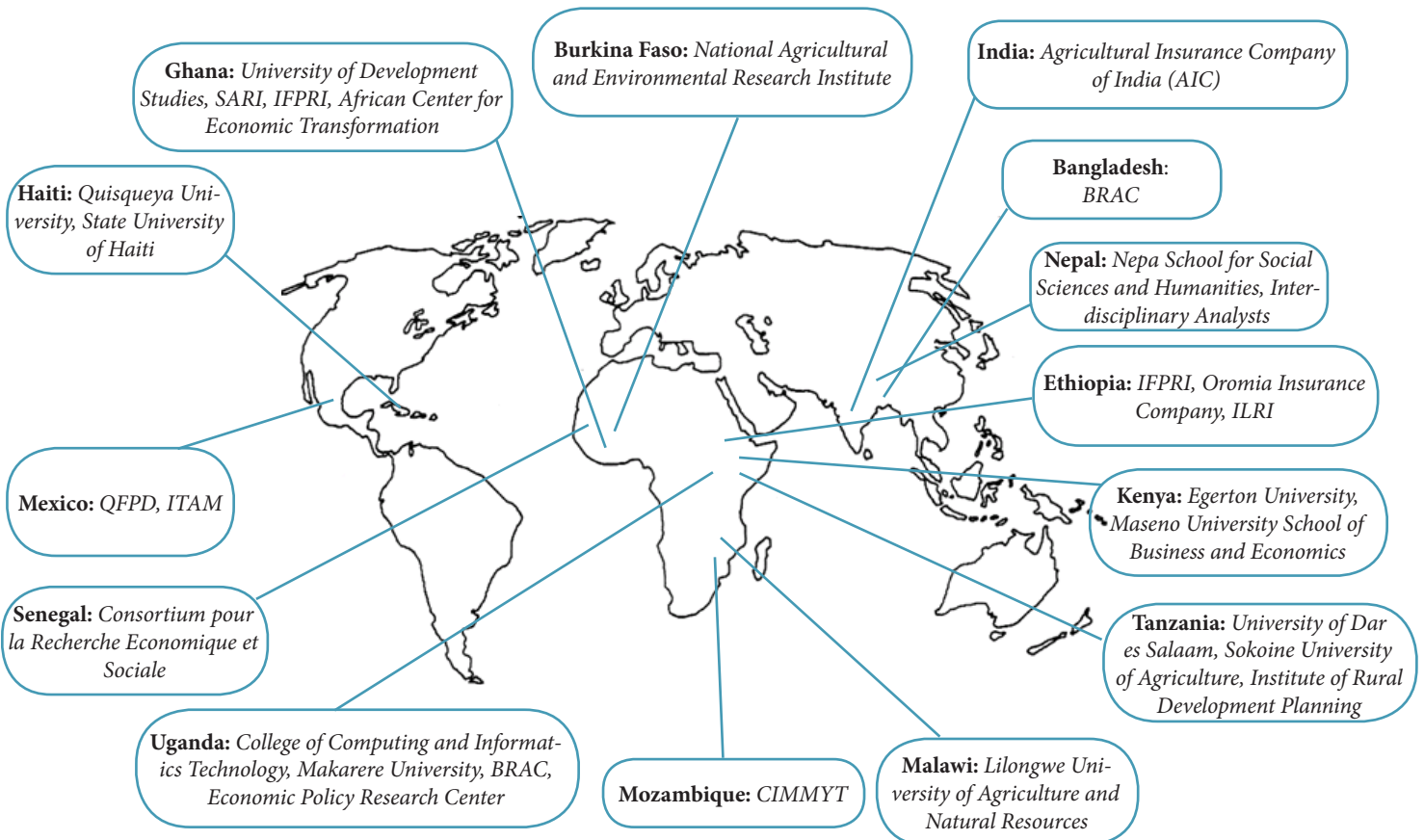


PI Mario Miranda from the Ohio State University with participants in a short training course.

Partner Institutions

The AMA Innovation Lab model requires researchers at United States universities to formally partner with at least one host country institution, however, many more informal collaborations are formed. For example, the research being conducted in Haiti with the State University of Haiti is an impact evaluation of an Oxfam implemented intervention. We do not list Oxfam below because though this work is being conducted cooperatively, no formal agreement or flow of money takes place. But these informal partnerships or collaborations are equally essential to the formal with regard to the work being done, and the capacity being built.

The institutions listed below are those with whom our consortium has at least a formal agreement for partnership in place, and typically includes a downflow of funding to support the partner institutions investments in the research being conducted.



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PROJECT MANAGEMENT ACTIVITY

Adapting to Project Evolution

The Assets & Market Access Innovation Lab is entering the final year of its current award, and will soon be bidding to serve as management entity again. As our current portfolio of projects begin to end and announce results, our priorities are shifting to increase emphasis on outreach and dissemination activities. In particular, we are trying to synthesize what has been learned across projects and to distill key messages and information to be clear and accessible for non-academic stakeholders.

We initiated this transition to increased emphasis on dissemination last year with the hiring of a 60 percent appointment of a Communications and Outreach Specialist. In September 2016 we further advance these efforts with the hiring of a full-time Strategic Communications Manager, Alex Russell, who will begin in October 2016. Alex joins the AMA Innovation Lab from the UC Davis Center for Poverty Research, where he similarly worked to translate research findings for policy audiences.

By releasing some of the communications responsibilities from the Assistant Director, this also allows for increased attention to ensure all contractual requirements have been fully met, deliverables have been submitted, and the contract closure is effectively managed. This also allows extra attention to be paid to the impending independent external evaluation of the AMA Innovation Lab and preparations to bid for renewal.

Associate Award for Enhancing Resilience

In September 2016, the Assets & Market Access Innovation Lab received an associate award entitled “Evaluating the Effectiveness of Programs that Enhance the Economic Resilience of Vulnerable Populations.” This award will be focused on **better understanding mechanisms designed to enhance the resilience of vulnerable populations**, and to provide scientifically reliable feedback on policies and programs that can boost the resilience and sustainably improve the livelihoods and human development of vulnerable households.

Vulnerability and unprotected risk are critical aspects of poverty, so strategies to address these challenges are essential elements of successful development interventions. Both before and after a shock, the strategies employed by poor families to cope with unprotected risk can be overwhelmed by the scale of the shock, and can be ineffective at preventing a slide into poverty traps. As USAID increases efforts to better understand mechanisms to enhance resilience and enable growth, the AMA Innovation Lab will seek to generate evidence on these critical issues.



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Increased Outreach & Dissemination Activities

Innovations in Index Insurance to Promote Agricultural Livestock Development in Ethiopia



Co-presented by the AMA Innovation Lab, ILRI, and IFPRI, this dissemination workshop was held in Addis Ababa on December 3, 2015. This event reviewed the variety of index insurance interventions that have been conducted in Ethiopia over the past several years.

The workshop brought together national policy makers, national and international researchers, donors, and implementers to review these experiences, discuss prospects for scaling up, alternative methods to reach out to farmers and pastoralists, and discuss the role of public and private actors in supporting index insurance.

The Economics of Asset Accumulation and Poverty Traps

This event was co-presented by the National Bureau of Economic Research (NBER) and the AMA Innovation Lab in June in Washington DC. While the world has seen progress in economic growth and poverty reduction over the past several decades, extreme poverty persists. Research has focused on improving our understanding of how households accumulate assets and increase their productivity and earning potential, as well as why many struggle to escape poverty. Despite this work, our understanding remains incomplete; further research is needed to understand factors affecting asset accumulation and the resulting productivity and income dynamics.

In addition to integrating what we have learned to date about poverty trap mechanisms, this event was designed to develop the implications of this knowledge for understanding the effectiveness of policies and programs designed to address these issues, such as cash transfers, microfinance, and technology transfer programs. After review and revisions, the papers commissioned for this conference will be submitted for publication in a conference volume. We anticipate this to be done in the first half of 2017.

Planning for Mind the Gap

The Assets & Market Access Innovation Lab has commenced planning a major dissemination event to be held on November 3rd at the Ronald Reagan Building in Washington DC. The event is called “Mind the Gap: Exploring the Disparities Between Smallholder Farmer Practice and Potential”. A description of the event is available in the bar to the right.

This event is an important step forward in synthesizing important results and policy implications across a number of projects in the AMA Innovation Lab portfolio and translating that research into identifiable strategies and interventions for policymakers. In essence, this event is intended to help bridge another significant gap that is often overlooked: the gap between research and policy.



PREVIEW OF UPCOMING OUTREACH EVENT:



MIND THE GAP

Agricultural research aimed at developing countries has typically focused on advancing the technological frontier: developing new tools, fertilizers, and hybrid seeds that increase crop yields, and ultimately, resiliency in the face of climate variability. However, the fact that average small farm yields consistently fall well below what is technically possible indicates that the benefits from these new innovations are not being realized by farmers.

While much has been done to understand the supply-side constraints, such as input supply networks, that prevent farmers from adopting new technologies, there are also significant demand-side obstructions. To “**Mind the Gap**” means better understanding these roadblocks that stop farmers from adopting new innovations, even when they are locally available, and working to design interventions to close yield gaps, increase productivity, and secure more sustainable livelihoods - ultimately paving the way out of poverty.

This workshop will highlight three categories of farmer-level constraints to the adoption of new technologies that our research has identified, and, through discussion, lay out potential strategies and interventions to reduce the yield gap by overcoming these barriers.

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Governance and Management Entity Activity

Increased Outreach & Dissemination

As described in our section on “Program Activities and Highlight”, the AMA Innovation Lab has dramatically increased our outreach and dissemination efforts in the past year. While that section of the annual report highlights key activities, here we would highlight that we hired a dedicated and experienced Strategic Communications Manager to ensure that our outreach and dissemination efforts are crafted to get the right information to the right people, and to ensure that our materials are accessible both to technical and non-technical audiences.

New Associate Award

The newly associated award, “Evaluating the Effectiveness of Programs that Enhance the Economic Resilience of Vulnerable Populations” was submitted to USAID during the past year, and was officially awarded just prior to the close of this federal fiscal year, September 29, 2016. The award is anticipated to span from 2016 to 2020.

The research conducted under this award will be focused on better understanding mechanisms designed to enhance the resilience of vulnerable populations, and to provide scientifically reliable feedback on policies and programs that can boost the resilience and sustainably improve the livelihoods and human development of vulnerable households.

Work in this area is deeply connected to work included in the current and recent past portfolio of the AMA Innovation Lab. The Lab has contributed significantly to work targeting vulnerable populations, including seeking to better understand persistent poverty and food insecurity, how best to improve the resiliency of poorer households and communities, and how to effectively increase the capacity of poorer households to engage in and benefit from agriculture-led growth.

Ongoing Management Activities

In addition to these new activities, the ongoing management activities of the AMA Innovation Lab Management Entity (ME) continue as planned. As we enter our final year of this phase of the activity, many of our research projects are concluding at the same time. We are working to ensure that these projects meet important objectives and report back appropriately.

In addition, we are preparing for an external evaluation of our work in hopes of a renewal. Outside of the external evaluation, we are also preparing to self-evaluate our progress against our original goals in this final year, and to refine what we see as future directions for our areas of research.

Simultaneously, our associate awards are still continuing activities, which we continue to monitor and manage.



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ISSUES (AND HOW THEY ARE BEING ADDRESSED)

Increased Demands for Dissemination

As our projects begin to reach their conclusions, and as many of our key issues gain attention in the development community, the Assets & Market Access Innovation Lab is seeing increased demands for outreach and dissemination activities. In many of our key research themes, we are beginning to gain a nuanced understanding of these complex issues, and the demand for outreach has exceeded the amount we can supply in given structure.

As such, the Assets & Market Access Innovation Lab is adding a full time Strategic Communications Manager beginning early in fiscal year 2017. **This will allow the Lab to not only be more responsive to demands for outreach activities, but to be proactive in disseminating what we have learned and how to apply it to Feed the Future and other implementation partners.**

Civil Unrest in Mozambique

The United States Embassy in Maputo and other relevant agencies have issued several travel warnings that reflect the threats to working in certain areas of Mozambique. For our associate award to investigate drought tolerant maize and index insurance, this has led to significant challenges moving forward with the work in the country. **Roughly two-thirds of our study area had to be abandoned and reselected** because the areas of study were unreachable due to the deteriorating security situation, especially along certain highways.

The Assets & Market Innovation Lab is **working with USAID mission in Mozambique to try to find solutions that allow the research to continue without putting our employees, subawards, or contractors at risk.** We have identified two new regions in which to conduct the intervention and are working now to move ahead in these new areas.



Project Officer (AOR) Transition

The AOR for the Assets & Market Access Innovation Lab, Lena Heron, moved with her family to Shanghai this year. She plans on continuing to work on her existing portfolio, including the AMA Innovation Lab, part-time and remotely, at least in the short to medium-term.

Her continued dedication to her portfolio and to our work obviously helps to smooth the transition to a new management plan, **however we are working - and must continue to work - with USAID and the Bureau of Food Security to ensure no administrative or programmatic details are lost in the transition.**



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FUTURE DIRECTIONS

Conclusion of Subaward Activities

As our subawards conclude field work and begin analysis and dissemination of results, the AMA Innovation Lab will continue to support these efforts to ensure this research is translated into relevant policy recommendations, and appropriately shared with stakeholders. In addition to the many dissemination events that will be held in the host countries for specific projects, that AMA Innovation Lab communications team will work to synthesize what has been learned across projects and share what we have learned from this targeted portfolio of projects into **regionally or globally relevant results, tools, and recommendations**.

Advancing Index Insurance & Filling Knowledge Gaps

The AMA Innovation Lab has made considerable progress in synthesizing what has been learned to date, and identifying the knowledge gaps that have remained (this was done, in large part, through the associate award to advance index insurance). Moving forward, we look forward to increased dissemination of what has been learned, including the creation of **policy-relevant tools for implementation partners**. In addition, we look forward to continuing research designed to **fill some of the critical knowledge gaps that remain**.

Tools & Guidelines for Implementing Partners

Looking ahead, the AMA Innovation Lab will continue to work with our partners to develop tools and guidelines for the responsible scaling of index insurance interventions. By translating what we have learned through research into usable, policy-relevant tools, we hope to advance the use of index insurance for risk management for smallholders.

Comparing Indices

The use of remote sensing for index insurance continues to grow, but little has been done to clarify which data or index is most appropriate. This research, led by Cornell University, will examine a set of indices to determine which is most effective for livestock insurance in southern Ethiopia and Northern Kenya, and use it to advise stakeholders as they expand these programs.

Integrated Safety & Cargo Nets to Alter Poverty Dynamics

Researchers at UC Davis and ILRI will conduct an impact evaluation of an integrated intervention in Kenya designed to protect both poor and non-poor vulnerable households from descents into poverty and to promote growth to test whether this integrated approach can alter poverty dynamics in practice.

Internal Assessment & Evaluation

As the main award to the AMA Innovation Lab approaches the end of its first five-year cycle, and prepares to bid to again serve as management entity of the Innovation Lab, **we will be looking back on our portfolio to date and reviewing our own performance** as management entity. In addition, as we continue to engage stakeholders on this important work, we will review the directions of our research and how well we are contributing policy-relevant, actionable information to our stakeholders, and how we might proceed if given the opportunity.



AMA Innovation Lab Success Story

DESIGNED FOR DEVELOPMENT Index Insurance Contract Design Innovations

The AMA Innovation Lab continues to work on developing [index insurance innovations](#) that maximize the potential for these tools to enhance the resilience of smallholder farmers. In 2016, researchers built on previous research insights to propose and refine a variety of contract design innovations crafted to ensure contracts work both for private sector partners and for the vulnerable farmers who purchase them. Challenges that typically face index insurance interventions, including basis risk and low uptake of insurance, have plagued index insurance products for years, but AMA Innovation Lab researchers are crafting solutions by designing innovations around the structure of the insurance contracts.

First, in [experiments in both Mali and Burkina Faso](#), researchers tested the use of a **“dual trigger” contract design** with an area yield-based index insurance product, in which insured cotton farmers are indemnified if the average yields in their area fall below a critical level. But at what geographic scale should the insurance be defined? Too large an area will not appropriately reflect the experience of individual farmers, too small and farmers can cooperate to manipulate outcomes. To mediate these opposing risks, researchers proposed a dual-trigger contract design in which farmers qualify for a payment when a smaller geographic area has average yields that fall below a critically low level, as well as a larger geographic area set at a higher trigger level. This dual trigger both offers high value to farmers and assures insurers that the contract will not be decimated by collusion within the village.

Second, AMA researchers have innovated a new kind of contract that includes an **“audit rule”**. This rule allows for farmers on the ground, if they feel that payouts should have triggered, but did not, to request an audit. Under this contract mechanism, if a certain agreed upon number of farmers request an audit, a random crop cutting will be conducted to assess whether a payout is warranted. If the crop cutting confirms the index, payout is not issued, but if it indicates that there was indeed a significant loss on the ground, farmers receive their expected indemnities. This will be piloted in [Tanzania and Mozambique](#) under an associate award in the coming year.

Finally, researchers have proposed a [new model](#) called **Village Insurance-Savings Accounts, or the “VISA Model”**. By incorporating this model into typical MFI operations, researchers believe this model can create a market and increase access to and uptake of agricultural insurance by smallholder farmers. By creating a dedicated savings account, or a “village insurance-savings account”, for interested savings group members, insurance becomes accessible, and it becomes easier to accumulate the funds for premium payment. MFI staff will work through the groups to educate them about the benefits and limitations of the insurance, as well as to facilitate premium savings, insurance sales, and payout distribution. While this design has not yet been field-tested, AMA Innovation Lab researchers are optimistic about the potential impacts of this design, and hope to test this model soon.

The AMA Innovation Lab will continue to pursue empirical evidence that these innovations can improve farmer welfare, and refine the guidelines to implement them effectively to encourage inclusive agricultural growth.



Terminology Overview

INDEX INSURANCE

Index insurance relies on an external measure to estimate farmer losses and determine payouts, rather than individual loss verification. This reduces the administrative costs dramatically, and also the cost of insurance.

DUAL-TRIGGER CONTRACT

The contract uses two triggers to determine payouts to avoid issues of farmer collusion and to strengthen the contract design. A more thorough description is available online on the [brief](#) on this experiment.

AUDIT RULE

An audit rule in a contract allows farmers to petition for a crop cutting “audit” of the insurance if the primary index does not trigger indemnity payouts but farmers have experienced significant losses on the ground.

VISA MODEL

Village Insurance-Savings Accounts integrate into existing MFI models to allow for gradual savings for premium payment, and creates an education and distribution model via MFI staff for the insurance product itself.

AMA Innovation Lab Success Story

KEEPING THE CLIENT CENTRAL Changing the Conversation to Client Value

While index insurance is promoted as an affordable alternative to conventional insurance in developing countries, its value to farmers is rarely assessed. In 2016, the AMA Innovation Lab built on its previous efforts to make client value and safe minimum standards for insurance an essential part of every discussion or analysis of index insurance products.

Much discussion around index insurance has focused on basis risk, or the risk that though farmers experience a significant loss, the insurance is not triggered by the index. Over the years there has been much [debate](#) on the precise definition of the term “basis risk”, but instead the AMA Innovation Lab Director Michael Carter is **changing the discussion to the broader topic of contract quality, and the value offered to a farmer** by an insurance product. The importance of this shift cannot be overstated, especially for those who promote index insurance as a tool to meet development objectives.

If the goal in the design of an index insurance product is to attain any development objectives – including consumption smoothing, asset protection, or reliance on foreign aid – it is not simply enough to design, market, sell and distribute an insurance contract. Just because a farmer has purchased an insurance product, that farmer is not necessarily better off. In fact, if the index insurance product is poorly designed, it can actually make farmers worse off than if they had not bought it.

The Assets and Market Access Innovation Lab seeks to [build a measure or metric](#) that will allow them to compare an index insurance product against a “perfect product”. Specifically, they seek to identify a means to know how far a product is from the goal of effectively stabilizing consumption for farmers in the event of a major covariate shock, and to be able to rank different index insurance products based on their ability to achieve these objectives.

Another approach the AMA Innovation Lab is facing this challenge is by talking about “Safe Minimum Standards” (SMS). Essentially, this question asks whether, by purchasing an insurance contract, a farmer is at least not worse off than if she had kept her money. For example, if an insurance premium is \$10 per year, and a payout occurs, on average, once every 10 years, and the average payout is \$30, the farmer would be better off doing something else with that money. Or, alternatively, if the index is poorly correlated with average farmer outcomes, it can serve as little more than a lottery ticket for the farmer, so is a poor use of her limited resources.

Finally, this past year the AMA Innovation Lab and its [partners](#) at the ILO have started design of a client value assessment tool. This tool, which will be widely disseminated amongst insurance stakeholders and implementers globally, will allow impartial assessment of insurance products and comparison across products. It will help stakeholders determine whether the insurance offers a basic safe minimum quality standard, such that farmers will not be left worse off for having purchased it. This tool and accompanying case studies should be finalized in early 2017, and by mid-year it will be widely disseminated for use by those seeking to responsibly advance index insurance.



Key Considerations

Keep the primary goal in mind: consumption smoothing for development impacts.

Ask yourself: Is the farmer better off buying the product than keeping the money?

Remember: design matters. It's vital to assess the value of a product before marketing & selling.

Always verify that the contract's index is highly correlated with farmer outcomes. Otherwise its just a lottery ticket!

AMA Innovation Lab Success Story

FINDING THE RIGHT FIT

Learning when indices do - or do not - work

Often in discussions about index insurance, rainfall-indexed insurance products are the first (or only) example of an index-based insurance product people can recall. However numerous studies have demonstrated that these products consistently fail to accurately predict the on-the-ground experience of farmers, frequently failing to payout when farmers experience dramatic losses. Further, the greater the distance between the farmer and the rainfall station, the worse the contract works for that farmer. When this is the case, and insurance contract is, in essence, little more than a lottery ticket.

AMA Innovation Lab researchers have successfully identified and advanced alternative indices that effectively predicts farmer losses, including area yield-based measures and myriad satellite-based measures. Further, AMA researchers are also beginning to better understand the conditions under which different indices might perform better or worse in a given context.

Because area-yield based indices are, by definition, highly correlated with yields in an area, these can be most accurate index in reflecting the conditions of farmers on the ground. However, these indices can be prohibitively costly to administer if the yield data is not already collected and made available at low geographic scales. The high costs of collecting such data when it is not already available often makes this design prohibitively expensive.

A more readily available source of data uses satellite imagery to estimate average yields on the ground (or, in the case of pastoralists, estimates of forage availability and estimates of associated livestock mortality). AMA Innovation Lab researchers have been [working with cutting-edge private sector partners](#) to refine how this data is used, including the systems that allow the index to differentiate between crops or forage and other greenery.

AMA Innovation Lab researchers have found success testing this index in a variety of contexts across Africa, including for pastoralists in East Africa and for farmers in Tanzania. When tested in [Nepal](#), however, satellite data proved inadequate to the task. Because Nepal's growing season is characterized by a monsoon season with dense cloud cover, satellites cannot get the imagery needed to effectively capture the situation on the ground. While disappointing, this is helpful to know.

As development professionals and governments consider options for index insurance, these nuances are vitally important in informing next steps and which options have the greatest potential in their individual context. The AMA Innovation Lab will, over the next year, work to further refine the optimal contexts for each index option, and then create essential materials to help inform those decisions.

Combined with cutting edge innovations in insurance design (see Success Story #1 in this report), these indices hold enormous potential to dramatically increase the quality of index insurance and its potential for development impact. Through this additional work to identify under what conditions different indices do – or do not – work effectively, the AMA Innovation Lab is making it easier for partners to thoughtfully consider what may work best in their individual contract, paving the way for success.



Different Indices

RAINFALL STATIONS

Rainfall has proven to be a poor predictor of farmer outcomes, getting worse the further the farm is from the rain station. There are likely few contexts this would

AREA-YIELD INDEX

While highly correlated with outcomes, the data can be costly to collect. This may, however, be the best option if the data is already available and/or satellite data is unsuitable for local weather patterns.

SATELLITE-BASED INDEX

Satellite imagery has been piloted with high success and is constantly being refined and improved. Work on crop masking to appropriately differentiate crops vs. other vegetation is ongoing.

DRONE IMAGERY

Little has been done to assess whether drone imagery could serve as an effective index, however the high-resolution imagery indicates high potential. Possible barriers include high costs and local regulations prohibiting drone flight.

AMA Innovation Lab Affiliates List: Primary & Secondary Institutions

Sub-Award Project Name	Location	Principle Investigator
CESDEM - 201121454-24 (BASIDRP) <i>Center for Social and Demographic Studies (CESDEM)</i>	Dominican Republic Dominican Republic	Maritza Molina Achecar Maritza Molina Achecar
Columbia - Breza 201121454-18 <i>Columbia University School of Business</i> <i>Fonkoze</i>	Haiti United States, NY Haiti	Emily Breza Carine Roenen
Columbia - Palm 201121454-15 <i>Columbia University</i> <i>Columbia University</i> <i>Columbia University</i> <i>Sokoine University of Agriculture</i> <i>University of IL at Urbana-Champaign</i>	Tanzania United States, NY United States, NY United States, NY Tanzania United States, IL	Dr. Cheryl Palm Malagosa Madajewicz Aurelie Harou Johnson Semoka Hope C. Michelson
Cornell - Turvey 201121454-15 <i>Cornell University</i> <i>Cornell University</i> <i>International Livestock Research Institute</i>	Kenya United States, NY United States, NY Kenya	Calum G. Turvey Calum G. Turvey Joshua D. Woodard Apurba Shee
FAMV - Lybbert 201121454-12 (BAHIHAI) <i>Faculte d'Agronomie et de Medecine Veterinaire (FAMV)</i> <i>State University of Haiti</i>	Haiti Haiti Haiti	Travis J. Lybbert Robers Pierre Tescar
George Washington University -Smith 201121454-07 <i>George Washington University</i> <i>George Washington University</i> <i>EPRS Policy Papers Outreach</i> <i>BRAC International</i> <i>African Growth and Development Policy Modeling Consortium</i>	Senegal & Uganda United States, Washington DC United States, Washington DC Uganda Uganda Senegal	Stephen Smith Stephen Smith Ram Fisherman Brookings Institution Africa Growth Initiative Munshi Sulaiman Dr. Samba Mbaye
IDA - Sharma 201121454-22 (BASINPL) <i>Interdisciplinary Analysts (IDA)</i>	Nepal Nepal	Sudhindra Sharma
ILRI - Mude 201121454-21 <i>International Livestock Research Institution</i> <i>International Livestock Research Institution</i>	Ethiopia Ethiopia Ethiopia	Andrew Mude Jimmy Smith
Michigan State Dillion 201121454-08 <i>Michigan State University</i> <i>Michigan State University</i> <i>Michigan State University</i> <i>Institute of Environmental and Agricultural Research (INERA)</i>	Faso United States, Michigan United States, Michigan United States, Michigan Faso	Andrew Dillion Maria Porter Melinda Smale Francois Lompo
NBER - Poterba 201121454-23 <i>National Bureau of Economic Research (NBER)</i>	United States, Washington DC United States, MA	Dr. James M. Porterba
NYU - Bell 201121454-27 <i>New York University</i> International Food Policy Research Institute Luanar Sub-Award, IFPRI Quantum Malawi Contracts with Mapemba, Droppelmann, Zavaleta, & NASFAM	Malawi United States, NY United States, Washington DC Malawi Malawi Malawi	Dr. Andrew Bell Patrick Ward Andrew Bell
Ohio State - Miranda 201121454-09 <i>Ohio State University</i> Ohio State University African Center for Economic Transformation African Center for Economic Transformation University of Ghana Institute of Statistical, Social, and Economic Research ACET Budget OSU Budget	Ghana United States, OH United States, OH Ghana, Accra Ghana, Accra Ghana United States, OH United States, OH	Mario J. Miranda PhD Abdoul Sam PhD Francis M. Mulangu PhD Nicolas Depetris Chauvin PhD Mario J. Miranda PhD Mario J. Miranda PhD

REDDOM - 201121454-25 <i>Rural Economic Development Dominican, Fundacion REDDOM</i> REDDOM, Survey Researchers	Dominican Republic Dominican Republic Dominican Republic	Jesus de los Santos Jesus de los Santos
SI - Vencove - Charter 201121454-04 (TZA,NPL,DRP) <i>SI Organization</i> SI Organization SI Organization	Tanzania, Nepal, Dominican Republic Dominican Republic Nepal Tanzania	John Kelly John Kelly John Kelly
Stanford - Shoven 201121454-10 <i>Stanford University</i> Maseno University School of Business& Economics Innovations for Poverty Axtion	Kenya United States, CA Kenya, Maseno Kenya	John Shoven Aphonce Odondo Noah Mambo
Tegemeo - Charter (BASIWSP, MRCATAI) <i>Egerton University</i> CropNut Tegemeo	Kenya Kenya, Nairobi Kenya Kenya	Mary Mathenge Mary Mathenge Mary Mathenge
UC Berkeley - Mahajan 201121454-26 <i>University of California - Berkeley</i> Instituto Tecnologico Autonomo de Mexico The World Bank Que Funciona para el Desarrollo	United States, CA Mexico United States, Washington DC Mexico	Dr. Aprajit Mahanjan Dr. Enrique Seira Dr. Xavier Gine MSc. Carolina Corral
UC Berkeley - Sadoulet 201121454-05 <i>University of California - Berkeley</i> University of California - Berkeley BRAC University BRAC University	Bangladesh United States, CA United States, CA Bangladesh Bangladesh	Elisabeth Sadoulet Jeremy Magruder Mahabub Hossain Narayan Das
UC Berkeley - Sadoulet 201121454-20 <i>University of California - Berkeley</i> BRAC University International Rice Research Institute (IRRI) India	Bangladesh United States, CA Bangladesh India	Elisabeth Sadoulet Shameran Abed, Mahabub Hossain Manzoor Dar, Mohammad Abdul Bari
UC San Diego - McIntosh 201121454-13 <i>University of California - San Diego</i> University of California - Berkeley University of California - Berkeley Sistemas Integrales Agrinet Makerere University Innovations for Poverty Action (IPA)	Uganda United States, CA United States, CA United States, CA Mexico Uganda Uganda Uganda	Craig McIntosh Paul Gertler Lauren Falcao Pual Nyende Richard Ssekibuule Sadat Ntume
UCLA - Mahajan 201121454-03 <i>University of California - Los Angeles</i>	Mexico United States, California	Aprajit Mahajan
University of Georgia - Magnan 201121454-16 <i>University of Georgia</i> University of Georgia International Food Policy Research Institute (IFPRI)	Nepal United States, GA United States, GA (For Nepal) United States, NY	Nicholas Magnan Sarah Janzen Ruth Meitzen-Dick
Univ. of Michigan - Yang 201121454-28 <i>University of Michigan</i> University of Michigan - [Graduate Student Research Assistantship (GSRA University of Michigan - (Research Administrator)	Mozambique United States, MI United States, MI United States, MI	Dean Yang Dean Yang Dean Yang
Univ. of San Francisco - Stopnitzky 201121454-19 <i>University of San Francisco</i> University of Alaska - Anchorage University of Dar es Salaam University of California - Davis	Tanzania United States, CA United States, AK Tanzania United States, CA	Yaniv Stopnitzky Matthew Reimer Pual Onyango James Wilen
Univ. of Washington - Dillion 201121454-17 <i>University of Washington</i>	Tanzania United States, WA	Brian Dillon

Institute of Rural Development Planning (IRDP)

Weber State University - Parkhurst 201121454-14
Weber State University
 Lilongwe University of Agriculture & Natural Resources (LUANAR)
 International Food Policy Research Institute (IFPRI)
 Univesrity of Leads

Yale - Mobarak 201121454-02
Yale University
 Agricultural Insurance Company of India (AICI)
 Yale University
 Institute for Finance Management and Research (IFMR)

Yale - Udry & Karlan 201121454-01
Yale University
 Yale University
 University of Development Studies
 Savannah Agricultural Research Institute (SARI)
 International Food Policy Research Institute (IPA)
 Ministry of Food and Agriculture (MoFA)
 Ghana Agricultural Insurance Pool (GAIP)

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