FEED THE FUTURE INNOVATION LAB FOR MARKETS, RISK & RESILIENCE

2020 Annual Report

CONTENTS

ACRONYMS

ALL IN   Advancing Local Leadership and Innovation Networks

BREAD   The Bureau for Research and Economic Analysis of Development

CIMMYT   International Maize and Wheat Improvement Center

CLA   Collaborating, Learning and Adapting

I4   Index Insurance Innovation Initiative

ICED   International Centre for Evaluation and Development

IFPRI   International Food Policy Research Institute

ILRI   International Livestock Research Institute

IZA   Institute of Labor Economics

MEL   Monitoring, Evaluation and Learning

MSI   Minority-serving Institutions

NBER   National Bureau of Economic Research

EXECUTIVE SUMMARY

The year 2020 was a year of unprecedented challenges. A number of climate-related disasters, such as heavy rains and locust swarms in Eastern Africa and drought across much of arid Sahel, were outweighed by the global catastrophe of the COVID-19 pandemic. The accumulation of regional and global catastrophes in a single year show how fragile the development community's successes have really been.

The Feed the Future Innovation Lab for Markets, Risk & Resilience at UC Davis has the increasing importance of resilience at all levels, from systems to individual families, at the very center of its research program. Launched in July in 2019 by USAID, the lab builds upon a foundation of field studies and theoretical work to help families and communities build resilience to perennial threats like drought but also against unforeseen shocks like the COVID-19 pandemic. We are also testing how resilience itself can generate additional returns through a well-established phenomenon we call Resilience+.

In our first year, we have launched twelve projects alongside two ongoing studies. This work represents some of the best ideas and innovations related to rural markets, agricultural risk and broadly based resilience. Two of these launched in a rapid response to the COVID-19 pandemic. Each of these projects is field testing ideas to learn if they address challenges rural families face while building the knowledge, experience and networks needed to scale up each success.

We have also been strengthening the network of researchers and organizations at work on these critical challenges. In August we launched the Advancing Local Leadership, Innovation and Networks (ALL IN) initiative that meets a high and growing demand for research funding among African researchers while increasing the capacity of African research institutions. We expect that leveraging local host-country research leadership will generate local solutions to major development challenges with an established pathway toward having an impact on national policy making.

In this rapidly changing field of development, the consistent thread is an increasing need to make families, communities and systems resilient to a wide range of shocks, both perennial and unforeseen. A research program like ours will only become more critical, especially as the COVID-19 pandemic is forecasted to undermine some of the progress in development made over the past decade. At the same time, the insights we as a research community are generating on the promise of building assets and providing a reliable and sustainable safety net will help us to rebuild faster and stronger.

To generate and transfer innovations that bolster resilience and enable rural individuals, households, communities and markets to sustain a process of inclusive agricultural growth.

MRR APPROACH TO FOOD SECURITY AND RESILIENCE

In spite of the tremendous progress in reducing the total number of extremely poor people over the past 30 years, extreme poverty has in fact concentrated in Sub-Saharan Africa and in South Asia. Extreme poverty continues to be a challenge in rural areas typified by low agricultural productivity, exposure high and increasing climate risks and vulnerability to instability and conflict.

The Feed the Future Innovation Lab for Markets, Risk and Resilience at UC Davis leads an innovative research program at the intersection of these critical challenges. The MRR Innovation Lab focuses squarely on constraints to agricultural transformation, poverty reduction and food security that are posed by risk and shocks.

The MRR Innovation Lab research strategy is driven by three priorities:

1. **Enabling Resilient Escapes from Poverty**: Shifting poverty dynamics for families and communities by amplifying synergies between programs that enhancing material assets, psychological well-being and manage risk.

2. **Financial and Agronomic Innovations for Inclusive Growth and Resilience**: Innovating the next generation of index insurance to make it a more effective and to open the door to a broader set of financial and agronomic instruments that promote resilience.

3. **Resilient Systems for Broadly-based Agricultural Growth**: Exploring ways to build and enhance systems that are both competitive and inclusive for women and youth.

MODEL OF INNOVATION

CYCLE OF RESILIENCE

We are testing ways to build virtuous circles of upward mobility and resilience. While this approach promotes a cycle of resilience for families who are already poor, providing a ladder up for vulnerable families who are not poor extends resources and efforts to build more resilient societies overall.

INCLUSIVE SYSTEMS

We are testing ways to make market systems both competitive and inclusive. Stronger markets can stabilize public finance while integrating rural communities, helping families to become and remain resilient to environmental and other shocks.

MANAGED RISK

We are developing and improving tools to manage risk so families coping with a shock can continue in their progress toward greater prosperity. We are at the forefront of a new generation of agricultural index insurance, microfinance and other tools that manage risk and build resilience.

RESILIENCE+

In emerging economies, disasters like drought, flood or conflict make people poor. The potential for disasters often keeps people poor by adding insurmountable risk to adopting development innovations like stress-tolerant seeds, or low-cost loans.

The MRR Innovation Lab innovates and field-tests approaches to reducing risk that create opportunities for families to adopt these productive technologies. Research shows that these tools can generate additional food and income that keep people from falling into poverty while building a ladder up for families who are already poor—that's Resilience+.

Resilience+ is the added dividend of smart, proactive investments in rural development in the presence of recurring disasters. The result is more families who can lift and keep themselves—and their future generations—out of poverty.

MANAGEMENT TEAM

Director Michael R. Carter is a distinguished professor of agricultural and resource economics at UC Davis. He directs the Index Insurance Innovation Initiative (I4) and the USAID-supported initiative Quality Index Insurance Certification (QUIIC). Carter is a fellow of NBER, BREAD and the American Agricultural Economics Association, and is an honorary professor of economics at the University of Cape Town. He is co-editor of *The Economics of Poverty Traps* (U. of Chicago, 2018).

Associate director Tara Chiu manages day-to-day operations, including monitoring research and HICD activities. She represents the MRR Innovation Lab to stakeholders and is the primary contact for USAID missions integrating research findings into policy and programs. She leads the lab's Monitoring, Evaluation, and Learning (MEL) plan and manages CLA activities. She holds a B.A. in Political Science from American University and a
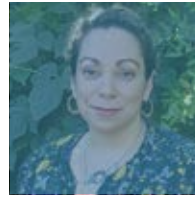
Master of Public Policy from Duke University.

Research finance officer Stefanne Haro-Maendly administers contracts and grants, including all MRR Innovation Lab subcontracts. She is responsible for all fiscal and administrative services, including budget analysis and financial reporting. Haro-Maendly has a B.S. in health education from San Francisco State University.

Policy engagement coordinator Sophie Javers guides a proactive engagement strategy for each research project awarded prior to the start of activities and provides researchers support as needed throughout the duration of the award. She holds a B.A. in History from Princeton and a M.A. in International Policy Studies from Stanford.

Strategic communications manager Alex Russell develops and implements the lab's communications plans and manages web and print communications with a focus on actionable resources and recommendations. He implements the lab's Knowledge Management Plan using a variety of media. Russell received his B.A. in Literature from UC Santa Cruz and his M.A. in English from UC Davis.

ALL IN KEY STAFF

ALL IN co-director David Sarfo Ameyaw is the founder, president and CEO of the International Center for Evaluation and Development (ICED). Ameyaw has over 25 years of experience in leadership and practical experience in monitoring, evaluation, research and learning. He has head senior posts at the Alliance for a Green Revolution in Africa (AGRA) and the Millennium Challenge Corporation (MCC). He is a board member of the Agriculture Technology Adoption Initiative (ATAI). Ameyaw holds a D.Min. in missions and community development and a Masters in Divinity from Andrews University.
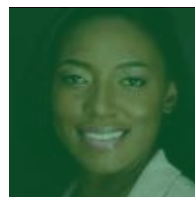
Finance and administration manager Blessing Mhosva manages ALL IN contracts and grants. She is a qualified Association of Charted Certified Accountants, UK (ACCA) accountant and holds a bachelor's degree in accounting.

Communications coordinator Stephine Ogutu leads communications efforts in Africa for ALL IN research projects. He leads all ICED communications efforts in Kenya and Ghana. Ogutu is a Communications for Development (C4D) specialist and has worked with USAID, USDA and many other local and international development organizations across Sub-Saharan Africa. He holds a B.A. in criminology and information technology from Maseno University and is currently pursuing an M.A. in communications.

ADVISORY BOARD

Ana Maria Ibáñez is a professor at the School of Economics in Universidad de los Andes (Colombia) currently on leave working as Economics Principal Advisor at the Interamerican Development Bank. Her research focuses on the microeconomic analysis of internal armed conflict, and the dynamics of land concentration and informality of property rights. Ibáñez received her Ph.D. in agricultural and resource economics from the University of Maryland at College Park.

Karen Macours is an professor at the Paris School of Economics and researcher at INRA. She is an affiliate of CEPR and of JPAL Europe. Her current research focuses on conditional cash transfer programs, early childhood development, rural poverty and agriculture. She received her Ph.D. in agricultural and resource economics from the UC Berkeley

Craig McIntosh is a professor of economics at the School of Global Policy and Strategy at UC San Diego where he is also and co-director of the Policy Design and Evaluation Lab. His main research interest is the design of institutions that promote the provision of financial services to micro-entrepreneurs, and he has conducted field evaluations of innovative anti-poverty policies in Mexico, Guatemala, Malawi, Rwanda, Uganda and Tanzania. He earned his Ph.D. in agricultural and resource economics from UC Berkeley.
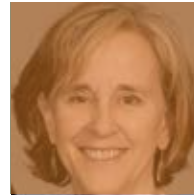
Jami Montgomery serves as Division Chief for the Resilient Communities and Systems Division of the Center for Resilience within the Bureau for Resilience and Food Security at the U.S. Agency for International Development (USAID). She integrates resilience into USAID's implementation of the Feed the Future initiative and provides technical support to field missions on strengthening the resilience of vulnerable communities in areas subject to recurrent crisis. Montgomery holds master's degrees in marine studies from the University of Delaware and in environmental engineering and science from Johns Hopkins University.

Robert Darko Osei is an associate professor in the Institute of Statistical, Social and Economic Research (ISSER), University of Ghana, Legon, and the vice dean for the School of Graduate Studies at the University of Ghana. His main areas of research include evaluative poverty and rural research, macro and micro implications of fiscal policies, aid effectiveness and other economic development policy concerns. Osei received his PhD from the University of Nottingham in the United Kingdom.

TECHNICAL COMMITTEE

The Technical Committee is composed of all principal investigators on MRR Innovation Lab projects. They meet annually for peer review and feedback on projects across the life cycle of an activity, including research design, preliminary results, ongoing challenges and potential solutions. These meetings will also facilitate the exchange of knowledge and lessons learned on cross-cutting issues that include gender, youth and capacity development.

TAPPING INNOVATION AT DIVERSE RESEARCH INSTITUTIONS

The MRR Innovation Lab took special care to ensure the opportunity reached researchers at Minority-Serving Institutions (MSIs) and institutes in Feed the Future target countries. We directly shared the opportunity with departments at 32 Minority-Serving Institutions (MSIs) designated by the Carnegie Classification of Institutions of Higher Education as doctoral universities with high and very high research activity. For our call for ALL IN proposals, our program partner, the International Centre for Evaluation and Development (ICED), actively marketed and shared the opportunity across Sub-Saharan Africa institutions through direct contact and webinars.

TECHNICAL LEADERSHIP AND RESEARCH STRATEGY

The MRR Lab allocates the bulk of its core research funding through competitive grants with a small amount set aside to commission research in response to specific and sometimes unexpected opportunities that emerge from the scientific research community. This approach encourages the greatest innovation from the best researchers.

Our research is funded through six potential mechanisms to maximize innovation and quality projects while also further building scalable results and research capacity worldwide. These include full-scale field trials funded up to $750,000 to low-cost grants support proof-of-concept research that may be expanded with full funding if successful.

Our research funding model has attracted creative and innovative research from collaborations between top researchers in economics, agriculture and related fields. To ensure a competitive process, we marketed calls for proposals broadly across the research community through multiple communications channels including our website, email newsletters, social media, listservs, research partner networks and direct contacts with academic departments at universities around the world.

- The main call closed with 73 proposals, ten of which were selected and are currently underway.

- The ALL IN call closed in August, 2020 and received 124 proposals currently under review.

Each proposal was reviewed by two external reviewers for technical merit, capacity building plan, and potential for policy integration and adoption. The MRR Innovation Lab Advisory Board, comprising leaders in development research and policy, has selected winning proposals. In order to avoid conflicts of interest, no external reviewer or Board members reviewed any proposal coming from their own institution. The USAID mission in each project's host country has had the opportunity to comment before research began.

PROGRAM ACTIVITIES AND HIGHLIGHTS

Since its launch in July, 2019, the MRR Innovation Lab set to work establishing an ambitious research program to promote food security and resilience. This included building its staff and Advisory Board, as well as releasing its first call for proposals to be led by U.S. and host-country research partnerships.

Almost immediately, the lab set to work establishing its research portfolio. The first major call for proposals launched in September, 2019 with 77 full proposals from which we selected 11 projects currently underway. These include two seed studies to establish proof of concept that can be used in the research team's search for additional funding. Many of these projects expand partnership with leading institutions such as the International Livestock Research Institute (ILRI), CIMMYT, the International Food Policy Research Institute (IFPRI) and many others.

The ideas and research teams in our first 12 projects sets the tone for the kind of quality possible through our research program structure. They are led by world-renown researchers at leading universities who are fellows of the National Bureau of Economics Research (NBER), Bureau for Research and Economic Analysis of Development (BREAD) and the Institute for the Study of Labor (IZA) as well as a Nobel Laureate.

New Partnerships to Expand Knowledge Sharing

The MRR Innovation Lab has already begun to expand its network of organizations working for toward the collective goals of building resilience among rural families facing multiple risks. In 2020, we partnered with the Global Resilience Partnership, the InsuResilience Global Partnership, and the MicroInsurance Network. These new partnerships amplify our voice in global conversations on insurance for development and resilience policy while expanding and informing our own research program.

These partnerships have helped us to reach a broader audience for our theoretical and field research on risk and resilience through webinar panel discussions, policy briefs and articles, network websites, social media and newsletters. Our June, 2020 webinar co-hosted with the Global Resilience Partnership brought our pioneering research on Resilience+ to a broad audience across 50 countries.

New Initiative to Jumpstart Africa-based Research Leadership

In May, 2020, the MRR Innovation Lab partnered with Kenya-based International Centre for Evaluation and Development (ICED) to launch the five-year $6 million Advancing Local Leadership, Innovation and Networks (ALL IN) initiative to mobilize and support research leadership in Africa. This USAID-funded initiative will build local solutions to major development challenges.

ALL IN issued its first call for proposals in August, 2020 with overwhelming interest from researchers at African institutions. This first call received more than 124 full proposals, and at the time of this writing a team of reviewers and the ALL IN management team are working to select the first projects.

RESEARCH MAKING POLICY IMPACT

The MRR Innovation Lab's work does not stop at research. We work in partnership with implementation partners starting with the planning of the intervention and through its completion. These partnerships make it possible to transfer successful interventions immediately, which we expect to stimulate scaling and to motivate global partners to replicate the innovations in their own contexts.

We also curate and synthesize evidence and ensure that it is translated into accessible and actionable formats. This includes resources that distill research findings, such as policy briefs, a well-organized and accessible website and other written materials. The entire management team also works collaboratively to design and deliver workshops and events that directly build the capacity of partners and stakeholders to apply evidence to policy and program design and to disseminate results broadly.

CURRENT PROJECTS SUMMARY

In our first year we have begun to assemble a portfolio of innovative research with high potential for development impacts in Bangladesh, Ethiopia, Ghana, Kenya, Mozambique, Nepal, Rwanda, Senegal, Uganda and Zambia. Though our focus is on applied research, we are also conducting theoretical research that contribute to our understanding of key dynamics of poverty and food insecurity that we can use to refine our search for solutions.

Enabling Resilient Escapes from Poverty

A Randomized Evaluation of an Integrated Graduation and Contingent Social Protection Program in Kenya

This randomized controlled trial (RCT) will investigate the impacts of the Rural Entrepreneur Access Project (REAP) Graduation Program and Index-based Livestock Insurance (IBLI)—alone and in combination—at the level of individual household outcomes as well as in terms of local poverty measures. *Led from UC Davis in partnership with the International Livestock Research Institute (ILRI) and The BOMA Project.*

Resilience in the Aftermath of Disaster in Mozambique

The MRR Innovation Lab is expanding an ongoing RCT to learn how communities recover from a disaster like Cyclone Idai and whether the program made communities more resilient and to extend USAID research on resilience measurement. *Led from the University of Michigan with partners Hamilton College, the Mozambique Ministry of Health and UC Davis.*

Health, Education, and Economic Interventions for Orphans and Vulnerable Children in Mozambique

This project evaluates the health and overall outcomes of the orphans and vulnerable children (OVCs) of Mozambique. *Led from the University of Michigan in partnership with World Education Inc./Bantwana.*

Resilience in the Midst of Pandemic in Nepal

In Nepal, an MRR Innovation Lab research team is expanding its partnership with Heifer International to explore how rural families are coping, whether its programming increases resilience, and the challenges and opportunities for improving household resilience in the midst of a global crisis. *Led from Kansas State University and the University of Georgia in partnership with Heifer International, Interdisciplinary Associates (IDA) and the Feed the Future Livestock Systems Innovation Lab.*

Gender, Nutrition-Sensitive Agricultural Programs and Resilience in Bangladesh

MRR Innovation Lab researchers are returning to Bangladesh to evaluate whether the improvements generated by a three-year program to promote agricultural diversity, increase income, improve nutrition and empower women sustained after a devastating cyclone. *Led from Cornell University in partnership with International Food Policy Research Institute (IFPRI); and Data Analysis and Technical Assistance Ltd, Bangladesh.*

Financial and Agronomic Innovations for Inclusive Growth and Resilience

Do No Harm: The Welfare Effects of Behavioral Index Insurance Interventions in Ethiopia

MRR Innovation Lab researchers are testing a "behaviorally smart" intervention with index-based livestock insurance in Ethiopia to maximize the welfare of all households by measuring their preferences and beliefs and providing tailored advice on the decision to purchase insurance. *Led from Georgia State University in partnership with the Center for the Economic Analysis of Risk (CEAR), Cornell University, the Ethiopian Environment and Climate Research Centre (ECRC), the International Livestock Research Institute (ILRI), Oromia Insurance Company and Utrecht University.*

Building Trust in Index Insurance with Picture-based Crop Audits in Ethiopia

In a new feasibility study, MRR Innovation Lab

researchers are testing whether smartphone pictures of crops before and after damage can help implement fail-safe audits in Ethiopia. This picture-based insurance (PBI) audit may dramatically improve contract responsiveness while keeping costs low. *Led from Michigan State University in partnership with the International Food Policy Research Institute (IFPRI) and the R4 Rural Resilience Initiative.*

Promoting Resilient Agricultural Growth with Area Revenue Index Insurance in Ghana

This project is developing an index insurance product that insures total agricultural revenue for small-scale producers while also expanding it to agricultural labor households who don't have physical crops but whose livelihoods depend on local agriculture. *Led from UC Davis in partnership with the Catholic University of America, Chr. Michelsen Institute, Esoko, Rhema Tidings, the University of Alabama, the University of Ghana and WorldCover*

Better Borrowing to Promote Access to Water and Improve Dairy Farming in Kenya

MRR Innovation Lab researchers are testing financial contracts for rain collecting water tanks, including a layaway savings plan, an asset-collateralized loan and a hybrid option that enables farmers to save towards the loan's deposit. *Led from Harvard University in partnership with Innovations for Poverty Action, Nyala Vision SACCO and Precision Agriculture for Development.*

Assessing the Impact of Digital Loans for Agriculture in Kenya

An MRR Innovation Lab research team is collaborating with partners in the digital finance and agriculture sectors in Kenya in a feasibility study to design and offer digital agricultural loans backed by weather index insurance. *Led from Kansas State University in partnership with Acre Africa, Pezesha Africa Limited, the University of Florida and the University of Georgia.*

Resilient Systems for Broadly-based Agricultural Growth

The Value of Linking Farmers to Maize Value Chains in Rwanda

In Rwanda, MRR Innovation Lab researchers are

measuring the impacts of connecting maize farmer cooperatives with the innovative processor Kumwe Harvest to provide a stable market for newly harvested maize while increasing the quantity accepted for purchase. *Led from UC Santa Cruz in partnership with ATAI, the Indian School of Business, Innovations for Poverty Action, Kumwe Harvest, MINAGRI, Williams College and the World Food Programme.*

Assessing Seed System Resilience with Structured Genotyping in Uganda

An MRR Innovation Lab research team is leveraging recent advances in DNA fingerprinting to test maize and bean seeds from across supply chains in Uganda to identify leaks responsible for low-quality seeds reaching farms, creating an opportunity to enhance seed system resilience. *Led from UC Davis in partnership with the CGIAR Standing Panel on Impact Assessment (SPIA), Diversity Arrays, the International Center for Tropical Agriculture (CIAT), the International Food Policy Research Institute (IFPRI), the Uganda Department of Crop Inspection and Certification (DCIC), the Uganda Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), and the Uganda National Agricultural Research Organization (NARO).*

Smoothing Seasonal Hunger through Planning in Zambia

This expansion of an ongoing project in Zambia expansion tests whether a low-cost planning intervention improves savings, shifts how families distribute household resources and whether the intervention changes how families make decisions at the next harvest. *Led from UC Berkeley in partnership with the Center for Effective Global Action (CEGA), Innovations for Poverty Action (IPA), UC Santa Barbara, University of Zambia and the Zambia Ministries of Agriculture and National Development Planning.*

Irrigation, Property Rights and Land Markets for Resilient Growth in Rwanda and Senegal

This MRR Innovation Lab project in Rwanda and Senegal explores how stronger property rights and better functioning land and labor markets can maximize the potential of large-scale irrigation projects to generate agricultural growth and resilience in rural communities. *Led from UC Berkeley in partnership with the European Union, IGC, the Rwandan Agricultural Board (RAB), the Rwanda Ministry of Agriculture, Université Gaston Berger and the World Bank.*

MRR INNOVATION LAB ACTIVITIES

The Feed the Future Innovation Lab for Markets, Risk and Resilience at UC Davis develops and tests financial and market innovations that take the most promising agricultural tools for families in developing economies from the lab to the field. In addition to funding research and building the capacity of local institutions, we translate our work into accessible policy documents and sponsor outreach events that integrate our findings into a coherent and effective voice about priorities and options for governments, NGOs and others working to reduce poverty and increase prosperity worldwide.

GOVERNANCE & MANAGEMENT ENTITY ACTIVITY

Shortly after the start of the MRR Innovation Lab award our Financial Analyst, Christine Mungo, had to move out of the area and resign her position. Recruitment for a new analyst proved challenging, and to find the right candidate it took four recruitments. By March 2020 we had identified and hired a new analyst, our Research Finance Officer, Stefanne Haero-Maendly. Her background and experience – including with US federal government awards – are already proving incredibly useful in ensuring all of the awards and planning is careful created, reviewed and documented. Christine, our former analyst, participated in remote contract work to both bridge the gap between analysts for essential matters and to onboard Stefanne to ensure a smooth transition to meet all requirements and responsibilities.

Sophie Javers, stakeholder engagement coordinator under AMA, is now the MRR policy engagement coordinator. This charges her with building on her previous role and expanding her scope of activities to directly increase policy impact of our research activities.

In partnership with the International Centre for Evaluation for Development (ICED), the ALL-IN management team assembled an Advisory Board for proposal selection and award management. Proposals were due at the end of August with comments from external reviewers due at the end of the 2020 federal fiscal year. These activities will be the start of a broadening of capacity development activities at the heart of the ALL IN initiative.

Finally, the MRR Innovation Lab management team began initiated a contract with Piestar, a provider of cloud-based systems and solutions with significant experience with Feed the Future Innovation Labs and USAID's reporting requirements, for current and future solicitations, and to assist in gathering annual reporting requirements. This resource enables a structured and more efficient approach to constant management and oversight of both solicitations and awarded activities.

ISSUES & FUTURE DIRECTIONS

In the second year of operations, the MRR Innovation Lab will primarily be focused on the following activities:

- Complete the selection of the project portfolio
- Continue and advance capacity development activities for ALL IN initiative
- Develop partnerships and broaden network for outreach, dissemination and policy engagement
- Assisting existing awards in determining how to best adapt to COVID-related disruptions to research activities (including disruptions to travel)

Before the end of 2020, the MRR Innovation Lab was hoping to complete selection of the research proposal. The ALL IN portfolio will be selected in October 2020, with some either given seed money or invited to revise and resubmit. The final awards are due at the end of 2020 and anticipated to be selected by the

ALL IN Advisory Board in Q1 2021. In the meantime, ALL IN capacity development activities will continue and expand to include the new research portfolio researchers and institutions.

Currently, in the last quarter of 2020, the MRR Innovation Lab hopes to release its anticipated last call for research proposals for US university-led research activities. The call for proposals will be refined based on the composition of the overall portfolio to date after ALL IN projects have been selected. However, an issue may arise if there are delays in funding appropriations from USAID, which creates significant uncertainty about timing of solicitation and award contracting.

For both the MRR Management Entity and the existing research portfolio, we will continue to adapt to the issues posed by COVID-related disruptions. For the management entity, we were already set up and experienced at remote collaboration within the ME because the team has adapted to busy travel responsibilities of several members. This includes shared filing systems and use of collaborative software applications. We also will continue to address these issues with subawards to discuss with research teams how best to adapt to project disruptions in the wake of COVID.

COVID-19 AND DEVELOPMENT INNOVATION

Our research partnerships reach across all sectors and communities, from donor agencies and governments to NGOs, private sector companies and individual families. These networks are also truly worldwide, from major city centers to the smallest rural areas. All of us are affected by COVID-19 even as we continue working to build a more resilient and inclusive future.

However, we worry in particular about interruptions to innovations that promise to put families onto a path to self-reliance. For example, in Samburu, Kenya the same social distancing policies being adopted worldwide have put the businesses and livelihoods of women taking part in our work at severe risk. Livestock markets have closed down. Our insurance company partner has pulled its agents from the field. Under these circumstances, any consequences we all face from economic contraction will not equal the long-term impacts for the women in Samburu sharing in our work.

These unprecedented times are testing the resilience of rural families and the food and market systems they rely on. The work we do has never been more important, and in spite of the challenges we all face, we will continue to make progress in building a more resilient future.

Michael Carter
Director, MRR Innovation Lab

Tara Chiu
Associate director, MRR Innovation Lab

IMPROVING THE DEVELOPMENT RESPONSE TO COVID-19

"Promoting asset growth and resilience is going to be incredibly important if rural families will have a chance to withstand drought, flood and now the COVID-19 pandemic."

—Michael Carter,
MRR Innovation Lab Director

The COVID-19 pandemic has created unprecedented global challenges and wiped out some of the progress made against poverty and food insecurity over the past decade. The MRR Innovation Lab quickly responded with new research to identify how the pandemic is affecting rural families and whether existing programs have made them more resilient to even this unforseen shock.

At the foundation of MRR Innovation Lab research is the understanding that promoting asset growth and resilience are critical for rural families to withstanding the perennial risk of like drought, flood and other climate-related disasters. We have expanded this research to learn what kinds of programs may also promote resilience to even unforeseen shocks like the COVID-19 pandemic.

The COVID-19 pandemic and the measures national governments around the world are taking to contain it have created new challenges for families who were already vulnerable to a number of climate-related disaster risks. COVID-19 has direct health effects for people who are infected. But even in countries where infection rates are low, government responses have indirect effects that reach across societies.

In early 2020, the MRR Innovation Lab launched two projects with support from USAID that are measuring how the COVID-19 pandemic is affecting rural families, as well as whether existing development programming has made them more resilient. Both projects build on

earlier work that collected detailed household data that make it possible to generate insights on responses to COVID-19.

In Kenya, we have added a survey to our ongoing research in Samburu, Kenya in partnership with The BOMA Project and the International Livestock Research Institute (ILRI). The project pairs a poverty graduation program with livestock insurance to help women to build an independent income while insuring them against losing that income in the event of drought.

In Nepal, we are building on prior USAID-supported research in partnership with Heifer International to measure whether a livestock transfer and training program to explore how families are coping and the challenges and opportunities for improving household resilience in the midst of a global crisis.

Livelihood building programs like The BOMA Project and Heifer International help families establish and grow new sources of income. This new income creates a pathway for staying food secure and above poverty. Livelihood building programs are not designed explicitly to make families more resilient to shocks like COVID-19, but they might.

For example, if a program encouraged families to save more, they will be more resilient to a loss of income than families who have not saved. A program that helps a family to build an additional income may be more resilient if their main livelihood disappears because of pandemic-related restrictions. Results from both projects will provide critical evidence for development programming that can effectively support families through this crisis.

FOUNDATIONS FOR SUSTAINABLE AND SCALABLE SUCCESS

"We work hard to establish partnerships in governments and the private sector at the start of the research journey so when we know what works, it has a clear pathway to scale."

—Tara Chiu
MRR Innovation Lab Associate Director

Successful research on how to achieve development goals can only contribute to overall progress if its most promising ideas are taken up and scaled. The MRR Innovation Lab takes a comprehensive, partner-focused approach to ensure our most successful innovations have a clear pathway to reaching rural families they can benefit most.

In our first year, the MRR Innovation has launched efforts to create a powerful enabling environment for the successful uptake of promising innovations to sustainably reducing global hunger and poverty while strengthening resilience. We are building the scaffolding to move these innovations from pilot to scale, from concept to policy by building and expanding our global partnerships and networks.

At the level of individual projects, we are laying the foundation to accelerate their scaling and policy impact. The way we structure our research in itself establishes the local public and private-sector partnerships needed for uptake and scaling. We are taking the additional step of building engagement strategies for each project, which includes stakeholder mapping, capacity development planning and plans for sharing results with USAID Missions and host-country governments.

More broadly we have taken an active role in three key global networks—the Global Resilience Partnership, the InsuResilience Global Partnership, and the MicroInsurance Network. These new partnerships amplify our voice in global conversations on insurance for development and resilience policy while expanding and informing our own research program. We participate in seven different working groups across these three organizations to share evidence and shape policy conversations around issues of resilience and risk management.

These partnerships have helped us to reach a broader audience for our theoretical and field research on risk and resilience through webinar panel discussions, policy briefs and articles, network websites, social media and newsletters. In 2020 our management team and researchers have presented in numerous webinars and dialogues hosted by these networks. For example, our June webinar co-hosted with the Global Resilience Partnership brought our pioneering research on Resilience+ to a broad audience across 50 countries.

As we further develop the MRR Innovation Lab research program, the relationships cultivated with these global networks and on-the-ground organizations will allow us to share our results, influence policy, and vastly enhance the ability to scale successful projects.

RESEARCH TO GENERATE RESILIENCE+

"My personal expectation of the webinar therefore is that it can provide additional insights and tangible ideas to move this conversation forward."

—Samuel Ssenyimba
The Gates Foundation Program Officer

Resilience is increasingly becoming a critical element in the field of development. The MRR Innovation Lab is charting the future of resilience through proactive interventions that help families to manage risk while also creating opportunities to build prosperity.

USAID defines resilience as the ability of people, households, communities, countries and systems to mitigate, adapt to and recover from shocks and stresses in a manner that reduces chronic vulnerability and facilitates inclusive growth. However, there can be an additional benefit of effectively managing risk.

Resilience+ is the idea that reliable risk-management tools benefit families in two ways. First, families are more immediately able to withstand a shock. Second, when a family knows they are protected they invest to improve their assets and income above where they began. This virtuous circle can become self-reinforcing.

MRR Innovation Lab research on Resilience+ builds on a broad literature across development economics, agronomics and related disciplines to not only learn what works to promote resilient livelihoods and prosperity but also to understand how. Research supported by USAID through the Feed the Future Innovation Lab for Assets and Market Access generated critical evidence for Resilience+ but also insights on how to plan interventions to generate it.

Three key AMA Innovation Lab projects demonstrated how development programs can generate Resilience+.

- In Mali, index insurance for cotton farmers provided payments after extreme drought but also increased cotton planting by between 25-40%.
- In Bangladesh, a BRAC emergency loan created a critical safety net while increasing rice planting by about 25%.
- In Mozambique and Tanzania, drought-tolerant maize seeds paired with index insurance for a seed-replacement guarantee led to 12 percent higher yields in normal years while nearly doubling investments in improved seeds after severe drought.

Resilience+ has received significant interest and inquiries from some of the leading donors in development who are seeking ways to incorporate the concept into their own work. In collaboration with the Global Resilience Partnership, we hosted a webinar about Resilience+ on June 3, 2020 that included panelists representing the African Development Bank, American University, The Bill and Melinda Gates Foundation, USAID and the World Bank.

The MRR Innovation Lab's new projects build on this momentum to further refine our understanding on how to most effectively generate Resilience+. In addition to our work measuring resilience to the COVID-19 pandemic in Kenya and Nepal, our teams are returning to prior research sites in Bangladesh and Mozambique to measure the lasting impacts of programs, even in the wake of a disaster. Our teams are also testing new innovations that have a strong chance of generating Resilience+, such as improved index insurance and new approaches to microfinance.

AFRICAN RESEARCH LEADERSHIP FOR POLICY IMPACT

"The ALL IN partnership will place ICED in the position to promote an indigenous, culturally sensitive research program. Our projects will be led by researchers who understand the context and culture on this continent and who have strong relationships with policy makers and understand the intricacies of policy."

—David Ameyaw
ICED founder, president and CEO

ALL IN is a new USAID research initiative that aims to advance host country leadership in defining and implementing research projects that develop and test financial and market innovations that take the most promising agricultural tools for families in developing economies while addressing capacity gaps among many research institutions in managing large and complex research awards.

In May, the MRR Innovation Lab and the Kenya-based International Centre for Evaluation and Development (ICED) launched the five-year $6 million Advancing Local Leadership, Innovation and Networks (ALL IN) initiative to mobilize and support research leadership in Africa to define and implement projects that build local solutions to major development challenges.

Feed the Future Innovation Labs are built on partnerships between researchers at U.S. universities and researchers at host-country universities and institutions. Historically, these partnerships have been led, both in program administration and the ideas that drive the research, from the U.S.

ALL IN shifts this leadership role to researchers in Africa who will define priorities and work with U.S. university research mentors to supplement their own skills, talents and ideas. In the same way that the MRR Innovation Lab and others select and administer U.S.-led projects, ALL IN projects will be selected and by an ALL IN Advisory Board, made up of leading academics and policy implementers. Management of the awards

will be co-led by ICED and MRR, with ICED in the lead.

ALL-IN is designed to provide the historically under-resourced African economic research community the resources it needs to fully engage and further develop and to fully utilize local institutions' clear pathways to local policy impacts. It creates a powerful pathway for Human and Institutional Capacity Development (HICD) that will help to transform research capacity in Sub-Saharan Africa.

The initiative also contributes to USAID priorities stated in its Higher Education Program Framework. While ICED is not an institution of higher education institution, all of the institutions receiving research awards are. This structure makes ALL IN contribute to the USAID Framework's three outcomes of developing the capacity of individuals and higher education institutions, strengthening partnerships and transnational relationships and promoting higher education as a central actor in locally led development.

Since it was established in 2017, ALL IN partner ICED has been incredibly successful at drawing attention to the critical importance of evidence across Africa. At the 2019 Evidence to Action conference, Republic of Ghana Vice President Mahamudu Bawumia joined as headline speaker. At the conference in 2018, Kenya National Treasury & Planning Cabinet secretary Henry Rotich announced that Kenya would establish an independent entity within the Government of Kenya and funded at roughly KSH 6 billion (about USD 60 million) dedicated to monitoring and evaluation.

The MRR Innovation Lab and ICED anticipate released the first ALL IN call for proposals in August 2020 and will fund the majority of its first round of projects by the end of the year.

FEED THE FUTURE AND HUMAN AND INSTITUTIONAL CAPACITY DEVELOPMENT (HICD)

The 2015 Feed the Future Human and Institutional Capacity Development (HICD) Strategy Review recognized that HICD "is broadening beyond technical skills to include and embrace management and related analytical capacities: the capacity to develop, hone and implement a vision and strategy, as well as 'softer' capacities like the capacity to reflect, to adapt, to continue learning, and to inspire " This is the underlying philosophy to the MRR Innovation Lab approach to HICD.

MRR INNOVATION LAB HICD IN ACTION WITH ALL IN

To address the dynamic and changing challenges of poverty and resilience, the MRR Innovation Lab is co-leading the Feed the Future ALL IN initiative to shifts control of research to economists in African countries. ALL-IN provides the historically under-resourced African economic research community the resources to fully engage, develop and utilize their local institutions as clear pathways to local policy impacts. ALL IN's African researchers take the lead in defining priorities and will then draw on US university-based mentors for support as needed to enhance their capacity in implementing and managing large-scale research projects.

As part of this award, the ALL-IN collaborative team provides, as needed and appropriate, support to researchers and their project managers in developing the capacity to manage and lead this award and others of a similar nature in the future. This award provides the opportunity to both researchers and staff to learn by doing in collaboration with mentors and peers at the ALL-IN management institutions.

ALL IN is guided by the following principles:
- Responsiveness to locally-demanded, policy-relevant research
- Commitment to local ownership
- Long-term planning for sustainability beyond MRR Innovation Lab support
- Building durable relationships across African-based researchers and institutions with local policymakers, US-based researchers and research institutions and other partners
- Providing opportunities to expand equity and inclusion in education and research opportunities

Organizational Capacity

The ALL IN initiative supports African researchers and

institutions as both providers and recipients of quality and applicable education and training to advance local capacity while enabling partnerships and network building. The initiative seeks to establish African research institutions as a key actor in the value chain of evidence-based policy.

There will be integrated capacity development for both the research and management tracks. ALL-IN researchers will be onboarded as a cohort and then will become part of the MRR Innovation Lab's virtual research consortium of US-led project investigators with annual meetings for feedback and peer review. These meetings, along with other ad-hoc meetings as appropriate, provide the opportunity to further enhance capacity, create opportunities for future areas of inquiry and strengthen research networks for all participants. The management teams from both ICED and the MRR Innovation Lab will have annual workshops to address emerging issues and anticipated future needs.

Our focus on building both the capacity of research and researchers (both faculty and students), creates an enabling environment for innovations in agricultural economics far beyond the initial investment. In alignment with the Global Food Security Research Strategy, this will "crowd-in" high-impact additional

high-impact investments for the institutions involved and "build our partners' self-reliance, and capacity to finance and implement solutions to their own development challenges."

Individual Capacity

While strong proposals will be awarded immediately, we also may identify promising ideas with specific gaps in the initial proposal that will benefit from "seed money" to refine the proposal. For these promising projects we will facilitate connections with US institutions that may help address any remaining technical challenges for resubmission.

Proposals will allow up to 15 percent of funds for training activities. This can be used to acquire technical skills required to effectively lead and implement research, such as specialized courses or travel to work with collaborators on key skills. We will, however, emphasize a broader approach. Per APLU's African Higher Education Report: "[L]ong-term and comprehensive partnerships provide a way of dealing with unanticipated challenges. In a sense, partnership become a resilience mechanism. More narrow technical assistance projects that are focused on a set of pre-defined deliverables cannot respond in the same way."

Impact Pathways

RESEARCH OBJECTIVES	ACTIVITIES	OUTCOMES	IMPACTS
Award Management: The MRR IL is partnering with ICED to create a regional hub to manage and monitor locally-led research activities.	**Award Management:** The MRR IL and ICED collaborate on creating management practices and structures to oversee financial and knowledge management of a portfolio of Africa-based research projects.	**Award Management:** • Through collaboration and learning by doing, ICED builds capacity to manage large, complex research awards from donor organizations. • ICED transfers research management skills to regional institutions.	**Award Management:** • A model for transfering research leadership to local institutions. • Additional donor investments into locally-led and locally relevant research.
Research: ALL IN places African researchers at the forefront of the process, applying for and leading directly funded research projects.	**Research:** • Call for proposals issued to African researchers. • Connecting US-based mentors to ALL IN projects as needed. • Conduct research. • Grantees join the larger MRR IL research cohort.	**Research:** • A strong portfolio of locally relevant research. • Developed institution capacity. • Developed researcher capacity through peer interactions with US-based MRR researchers.	**Research:** A locally determined research agenda and utilizing the local knowledge and connections will help close the gap between evidence and policy.

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Do No Harm: The Welfare Effects of Behavioral Index Insurance Interventions in Ethiopia

Location: Borana region of Ethiopia

Lead Principal Investigator: Glenn Harrison, Georgia State University

Collaborators: Center for the Economic Analysis of Risk (CEAR), Cornell University, Ethiopian Environment and Climate Research Centre (ECRC), International Livestock Research Institute (ILRI), Oromia Insurance Company, Utrecht University

Timeline: 2020-2021

Funding: $355,164 (USAID)

Description: MRR Innovation Lab researchers are testing a "behaviorally smart" intervention with index-based livestock insurance (IBLI) in Ethiopia that maximizes welfare by measuring preferences and beliefs and providing tailored advice on the decision to purchase insurance. This project will provide guidance to policy makers about how to evaluate insurance's contribution to welfare based on households' preferences and beliefs. The project will also provide insights about how insurance companies can modify their approach to focus on enhancing welfare, which is especially important for creating a stable customer base in the long run.

Achievements: Contracting between UC Davis and Georgia State was finalized on 29 January 2020. Georgia State is currently finalizing the sub-recipient agreements with program partners. Project collaborators have made advances on research design, survey instruments and coding of specialized software for the field experiment.

Capacity Building: PI Chris Barrett brought on Hyuk (Harry) Son, a 3rd year PhD candidate in Economics at Cornell to work with him as a graduate research assistant to assist and support on the project. Collaborating partners including the International Livestock Research Institute (ILRI), Ethiopian Environment and Climate Research Centre (ECRC), Cornell University, Utrecht University, and the Center for the Economic Analysis of Risk (CEAR) at Georgia State University continue to work and engage on the research planning together.

Lessons Learned: The uncertainty around the COVID-19 pandemic is a current concern. As the project is not yet in the field, project partners are keeping in close contact with one another and passing along local information as it comes in.

Presentations and Publications: Two-page project summary, "Do No Harm: The Welfare Effects of Behavioral Index Insurance Interventions in Ethiopia."

Theory of Change: Drafting still underway.

Impact Pathways

RESEARCH OBJECTIVES

Measure preferences and beliefs to conduct a "behaviorally smart" conditional IBLI intervention in the Borana Zone of Ethiopia that considers the preferences and beliefs that drive whether pastoralist households purchase index insurance.

ACTIVITIES

1. Baseline survey to measure a household's preferences and beliefs
2. Intervention implementation with three groups, control and two treatments tailored on information gathered from the baseline survey

The project will utilize the infrastructure of an existing index-based livestock insurance (IBLI) product

OUTCOMES

Increased understanding around whether tailored behavioral interventions making it possible for them to maximize their welfare by deciding to purchase or not purchase insurance.

IMPACTS

1. Generate large welfare gains for some, but also no significant welfare losses for others.
2. Based on the project results, the quality and impacts of this insurance programming will help ensure that the intervention does not harm those it is trying to protect.

Gender, Nutrition-Sensitive Agricultural Programs and Resilience in Bangladesh

Location: Bangladesh

Lead Principal Investigator: John Hoddinott, Cornell University

Collaborators: International Food Policy Research Institute (IFPRI); Data Analysis and Technical Assistance Ltd, Bangladesh

Timeline: 2020-2021

Funding: $405,924 (USAID)

Description: The 2015-2018 Agriculture Nutrition and Gender Linkages (ANGeL) project in Bangladesh improved agricultural production practices, children's diets and relationships in the home. In 2019, a devastating cyclone struck the area, compromising cropland and housing in four of the 16 districts participating in a International Food Policy Research Institute (IFPRI) randomized controlled trial on the program's impacts.

The MRR Innovation Lab is supporting the IFPRI research team to re-survey original study participants to measure whether the ANGeL program's improvements sustained after the cyclone. The study will contribute to growing evidence on resilience while building on the initial program results to inform policies to build resilience to weather-related shocks.

Achievements: Completed initial planned activities: (1) Signed sub-contracts with IFPRI and DATA (the firm responsible for data collection in Bangladesh) (2) Developed, pilot tested and revised survey instruments (attached with "supporting documents") (3) Received IRB approval for the study (4) Recruited and trained enumerators but suspended all surveys due to the COVID-19 pandemic.

Capacity Building: Researchers completed enumerator training in early March, just as the first COVID-19 cases were reported in Bangladesh. On March 12th, survey teams went into the field. By March 18th, it was decided that survey work would no longer be feasible.

Lessons Learned: Researchers continue to monitor the situation in Bangladesh. As of August 2020, we learned: (1) The pandemic continues to affect Bangladesh. While the case-fatality rate is low, the number of infections relative to population remains high and there are concerns that (given limited testing) the reported rate of infections is considerably below the actual rate. (2) Restrictions on movement and on economic activity have been gradually lifted (3) Starting in mid-August, a number of small-scale in-person surveys have been fielded in Bangladesh by other organizations (4) Cornell University continues to prohibit faculty and students from undertaking international travel that is business or research related.

Presentations and Publications: Two-page project launch summary, "Gender, Nutrition-Sensitive Agricultural Programs and Resilience in Bangladesh."

Theory of Change: Drafting underway.

Impact Pathways

RESEARCH OBJECTIVES

Test whether agricultural interventions that diversify income and improve nutrition lead to sustained improvements in assets, agricultural diversification, diet diversity and women's empowerment even through significant economics shocks.

ACTIVITIES

Re-survey individuals and households that participated in the Agriculture Nutrition and Gender Linkages (ANGeL) Project.

Particular attention will be paid to districts within the original ANGeL intervention that were affected by the 2019 Cyclone Fani.

OUTCOMES

The survey will generate information in 4 domains:
1. Gender disaggregated information about assets
2. Income diversification based on non-staple crops grown
3. Diet Diversity based on the Food Consumption Score
4. Women's Empowerment based on Pro-WEAI.

IMPACTS

Evidence on the longer-term impacts of the ANGeL intervention as well as a contribution to the design of policies to help families, women and children in particular, to better be able to withstand shocks brought on by climate change.

Assessing the Impact of Digital Loans for Agriculture in Kenya

Location: Kenya

Lead Principal Investigator: Sarah Janzen, Kansas State University

Collaborators: Acre Africa, Pezesha Africa Limited, University of Florida, University of Georgia

Timeline: 2020

Funding: $35,000 (USAID)

Description: MRR Innovation Lab researchers are conducting a feasibility study in Kenya to explore a sustainable approach to extending digital credit to small-scale farmers and its potential impact on their wellbeing. The team is collaborating with partners in the digital finance and agriculture sectors to design and offer digital agricultural loans backed by weather index insurance and that are large enough to make meaningful investments while providing the flexibility to make payments after harvesting crops.

The goal of this project comes in two parts. One is to examine the impact of digital credit on farmer wellbeing and to assess if relaxing credit constraints enables rural small-scale farmers to escape from poverty. The second is to evaluate the impact of digital credit in building the resilience of small-scale farmers, and their ability to manage risks that threaten these escapes. This feasibility study will also lay the foundation to implement a future rigorous impact evaluation to test how digital credit shifts opportunities and wellbeing for small-scale agricultural families. The full project will also include an agricultural index insurance component to leverage the complementarity of these two financial technologies.

Achievements: Consultant Sebastian Bascom, was hired in early 2020. He moved to Kenya in early February then returned to the US in mid-March due to the COVID-19 pandemic. PI Sarah Janzen also traveled to Kenya in early February to train Bascom and facilitate initial contact and meetings with potential partners. Important meetings included those with the USAID Mission, Pezesha, Acre Africa and Busara.

Capacity Building: The project trained consultant Sebastian Bascom in impact evaluation methods and data analysis using STATA. Bascom is now in graduate school.

Lessons Learned: The project was built on the idea that the researchers need people to consistently engage Kenya partners face-to-face. COVID-19 has affected the team's ability to do this. The team still believes it is critical to have consistent engagement, ideally in-person to build a strong collaborative network.

Presentations and Publications: Two page project launch report, "Assessing the Impact of Digital Loans for Agriculture in Kenya."

Theory of Change: Drafting still underway.

Impact Pathways

RESEARCH OBJECTIVES

Explore the feasibility of a financial market innovation with the potential to promote inclusive agricultural development: digital credit backed with index insurance, where digital credit refers to loans applied for and approved through mobile phones.

ACTIVITIES

1. Seek a lender for loan capital.
2. Engage with USAID staff in the USA and in Kenya to assess logistics and cost/funding mechanisms for a DCA mechanism to back the loans.
3. Seek input from the USAID Kenya Mission on geographical targeting.
4. Qualitative research to explore adverse selection and moral hazard in digital credit.

OUTCOMES

1. Established new partnerships.
2. Lay foundation to implement a full complement of impact evaluation activities.
3. Ground-truthed feasibility of larger scale project.

IMPACTS

1. Clarity and initial evidence that additional innovations integrated with digital agricultural loans will increase access to credit and bolster financial inclusion.
2. Understanding of whether the project should continue to next stage of research as a full proposal.

Smoothing Seasonal Hunger through Planning in Zambia

Location: Eastern Province, Zambia

Lead Principal Investigator: Supreet Kaur, UC Berkeley

Collaborators: Center for Effective Global Action (CEGA), Innovations for Poverty Action (IPA), UC Santa Barbara, University of Zambia, Zambia Ministries of Agriculture and National Development Planning

Timeline: 2020-2021

Funding: $256,716 (USAID)

Description: This project expands an ongoing randomized controlled trial in Zambia that tests a low-cost planning intervention that encourages families to save more of their harvest for the lean season. MRR Innovation Lab funding adds two rounds of data collection to measure whether the benefits of the intervention sustain through the end of the hungry season. The data will also make it possible to measure gender-differentiated effects on how families allocate their resources in the household as well as how they make decisions leading up to the subsequent harvest.

Achievements: During the reporting period, our project team adapted the planning intervention and surveys to be safely carried out under Covid-19.

With the guidance of our implementation partner, IPA Zambia, we submitted and received approval to restart research under our amended Covid-19 protocol from the Zambian Ministry of Health and UC Berkeley's Committee for the Protection of Human Subjects. Our project team successfully applied for additional funding from USAID's Development Innovation Ventures (DIV) and received the award during the reporting period. DIV funding will support an additional phase of the project, which involves carrying out the planning intervention with more households and collecting additional surveys to measure treatment outcomes. Working with DIV will also encompass direct interaction with the USAID Mission in Zambia, including receiving Mission feedback on the initial project proposal and results as they come in.

Capacity Building: Throughout August and September 2020, our team and IPA Zambia hired a Field Manager and Research Assistant to support project roll out and trained 13 enumerators to conduct surveys with participants following our Covid-19 protocol. The Field Manager and Research Assistant have been coordinating the enumerator training and deployment to carry out the planning activity and collect baseline data.

Lessons Learned: Our largest learning experiences were related to adapting our planning activity and survey procedures under Covid-19.

Presentations and Publications: Two-page project summary, "Smoothing Seasonal Hunger through Planning in Zambia."

Theory of Change: Drafting still underway.

Impact Pathways

RESEARCH OBJECTIVES

Expand existing field work to investigate whether farmers affected by seasonality can be encouraged to save more of what they have using a light-touch low-cost planning intervention implemented in rural Zambia.

ACTIVITIES

Guide families in the treatment group to think through how to allocate their post-harvest maize for upcoming expenses. They are given maize bag labels to visually represent their plan. The team is conducting rolling surveys to evaluate the project's impacts on consumption, farm investments, yields, profitability and labor supply.

OUTCOMES

The additional round of data collection will contribute to the potential of this labeling intervention and future plans for scaling up to village-level interventions. Evidence of impacts and training materials will be provided to the relevant Zambian government ministries and local NGO's.

IMPACTS

Families will manage the risk of running out of food too soon before the next harvest, making them more able to manage shocks without compromising their health and well-being. A better understanding of behavioral constraints to seasonal saving will complement government policies to aid farmers in need.

Assessing Seed System Resilience with Structured Genotyping in Uganda

Location: Uganda

Lead Principal Investigator: Travis Lybbert, UC Davis

Collaborators: CGIAR Standing Panel on Impact Assessment (SPIA), Diversity Arrays, International Center for Tropical Agriculture (CIAT), International Food Policy Research Institute (IFPRI), Uganda Department of Crop Inspection and Certification (DCIC), Uganda Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), Uganda National Agricultural Research Organization (NARO)

Timeline: 2020-2022

Funding: $250,005 (USAID)

Description: This MRR Innovation Lab team is conducting a comprehensive study of Uganda's maize and bean seed value chains to identify sources of failures in seed quality. The study is built upon genotyping, which establishes plant material's true variety and origins with a sample of its DNA. The team is comparing the DNA fingerprints of seeds on individual farms and is following the genetics upstream by sampling seeds at key links in the supply chain all the way to breeders. This approach makes it possible to identify leaks responsible for low productivity, poor disease resistance and low nutritional values.

In addition to genotyping, the team is identifying beans that are bio-fortified and testing soil samples from the plots where the beans are cultivated for their micronutrient content. These additional analyses will reveal interactions between bean varieties and local soils to determine the crop's micronutrient content at scale.

This project could enable significant improvements in the most important seed systems. These improvements could translate directly into household welfare gains through increased agricultural productivity and improved nutrition both on-farm and through local food markets, and greater food security through more remunerative and reliable livelihoods.

Achievements: Due to covid-19 no field work was initiated. The researchers were able to put a team together on the ground that will be working closely with the ministry inspectors to collect the needed samples. Fieldwork is expected to begin in December 2020.

Capacity Building: No capacity building activities on this project has begun due to COVID-19

Lessons Learned: No lessons have been learned concerning this project due to COVID-19 delays.

Presentations and Publications: Two-page project summary, "Assessing Seed System Resilience with Structured Genotyping in Uganda."

Theory of Change: Drafting still underway.

Impact Pathways

RESEARCH OBJECTIVES

Provide the first comprehensive, nationally-representative and rigorous evidence of the genetic integrity of the maize seed system in Uganda.

ACTIVITIES

- Sample planting material at key points along the maize seed value chain.
- High-density genotyping assays of the planting material at each designated point in the value chain to identify the main sources of genetic impurities.
- Conduct a similar but smaller scale pilot study of the bean seed system.

OUTCOMES

This project will uncover links between maize breeders, seed companies and farmers that are responsible for low seed quality.

The focused bean seed pilot will be the basis for a future extension to a nationally-representative assessment on par with the maize seed system study.

IMPACTS

- Policy-relevant insights for future innovations and a rigorous baseline for evaluating on-farm impacts.
- Resilient seed systems that deliver high quality planting material that has not been compromised by inferior production, storage or outright fraud.

Building Trust in Index Insurance with Picture-based Crop Audits in Ethiopia

Location: Ethiopia

Lead Principal Investigator: Maria Porter, Michigan State University

Collaborators: International Food Policy Research Institute, R4 Rural Resilience Initiative

Timeline: 2020

Funding: $39,995 (USAID)

Description: In this feasibility study, MRR Innovation Lab researchers have partnered with R4 Ethiopia and IFPRI to test if smartphone pictures can be used to implement fail-safe insurance audits. Comparing contracts with and without this type of audit, the team is measuring factors known to influence demand for insurance: trust, fairness, understanding, liquidity constraints, quality, premiums and women's constraints to benefit from index insurance. About half of participants are women, providing estimates of gender-based differences in demand and/or preferences. The team is exploring the possibility of recruiting married couples in order to examine intra-household differences in decision-making.

Achievements: While COVID-19 has hindered field research, the team has strengthened their partnerships with IFPRI, R4, and the Debre Zeit Agricultural Research Center of the Ethiopian Institute for Agricultural Research. They have also met bi-monthly basis to discuss developments in R4's weather index insurance program. The team is now part of R4's index design team. In addition, IFPRI is currently collecting an additional round of images for Picture-Based Insurance in 24 villages in Amhara and Tigray, with crop cutting experiments and picture-based image assessments starting any time from now; this was possible without creating face-to-face contact.

Capacity Building: Through meetings with the R4 Rural Resilience Initiative, the team has been in conversation with NGO (REST and ORDA) implementing R4's insurance program as well as Daniel Osgood from Columbia University's International Research Institute for Climate and Society (IRI). Osgood's team has been developing the weather indices for R4.

Lessons Learned: R4 has changed the scale of its index from kebele to woreda, but implementing partners are farmers are concerned about basis risk. IRI has been facing challenges in developing indices that can be scaled up beyond the initial pilot villages across multiple agro-climatic zones and elevations.

Presentations and Publications: Two-page project summary, "Building Trust in Index Insurance with Picture-based Crop Audits in Ethiopia"

Theory of Change: Drafting still underway.

Impact Pathways

RESEARCH OBJECTIVES

Test a new methodology to enhance the precision of a crop insurance for the R4 Rural Resilience Initiative in Ethiopia. The project will also study factors known to influence demand for insurance: trust, liquidity constraints, quality, premiums, and women's constraints.

ACTIVITIES

1. Collect data to inform the design of a large-scale RCT to assess the impact of integrating image-based crop monitoring into the R4 insurance indices.
2. Study the effects of using ground pictures as a fail-safe trigger in claims settlement.
3. Introducing farmers to insurance games for learning more about the R4 insurance product.

OUTCOMES

This project will generate evidence around reducing basis risk and the improving trust and understanding of index insurance among smallholder farmers. It will also build the capacity of EIAR around monitoring and evaluation.

IMPACTS

Knowledge about premiums farmers may be willing to pay, factors influencing demand, whether an actuarially fair price is plausible and whether insurance subsidies are needed. The project will also expand knowledge on financial access to rural families, the application of digital technologies and the adoption of improved technologies.

The Value of Linking Farmers to Maize Value Chains in Rwanda

Location: Rwanda

Lead Principal Investigator: Jonathan Robinson, UC Santa Cruz

Collaborators: ATAI, Indian School of Business, Innovations for Poverty Action, Kumwe Harvest, MINAGRI, Williams College, World Food Programme

Timeline: 2020-2023

Funding: $410,000 (USAID)

Description: MRR Innovation Lab researchers are connecting maize farmer cooperatives in Rwanda with Kumwe Harvest, a logistics and maize processing startup in Rwanda, to provide a stable market for newly harvested maize while increasing the quantity accepted for purchase. This study will examine how access to Kumwe Harvest affects farmers' investments into productivity enhancing inputs, specifically fertilizer, as well as agricultural output, total yields and sales. The project will also measure how farmers procure grains and other items after selling their entire harvest to Kumwe. Measuring impacts separately for men and women will provide important insights on the gender-related impacts of linking farmers groups to value chains.

Achievements: This reporting session, the main activities included: constructing a database of cooperatives in Rwanda, conducting a screening survey, selecting a sample, random assignment, and enrollment of treatment cooperatives. Enrollment meetings took place in early Aug. 2020, with the aim of registering cooperatives for participation in the study, as well as collecting some additional demographic and operational information about coops.

Capacity Building: Training of WFP staff and other interested parties are on hold due to COVID-19. The team did hire full-time Rwanda RA Aline Uwimanzi and field manager Melissa Mahoro who will have training from Innovations for Poverty Action. The team also engaged with local government officials, including a number of meetings with district authorities in the Eastern and Southern provinces, providing the necessary approvals to meet with cooperatives and to broadly inform relevant stakeholders about the study.

Lessons Learned: The team identified a sample and enrolled treatment cooperatives, and are working with Kumwe Harvest in the coming months to ensure that treatment is delivered. One lesson is that it's possible to plan a complicated project remotely, at least for some time. They hope that COVID restrictions will be less severe by the time of the end-line survey.

Presentations and Publications: Two-page project summary, "The Value of Linking Farmers to Maize Value Chains in Rwanda."

Theory of Change: Drafting still underway.

Impact Pathways

RESEARCH OBJECTIVES

Test whether connecting farmers to a post-harvest processing start-up (Kumwe) will alter farmers investment in productivity-enhancing inputs, and ability to contribute to the greater maize market system.

ACTIVITIES

1. Conduct two rounds of the experiment, spread over two seasons.
2. Connect treatment farmers to Kwame services. Kumwe will work with cooperatives to enter into pre-harvest buyer contracts.
3. Collect data from Kumwe and conduct in-person surveys with farmer cooperative representatives and randomly selected farmers.

OUTCOMES

1. Input purchases, as measured from the SNS database.
2. Surveys of cooperatives and of randomly selected farmers that include factor inputs, agricultural output, total yields and sales.
3. Measure of food consumption to show how farmers in treated cooperatives procure grains and other items after selling their entire harvest to Kumwe.

IMPACTS

This research will show how staple food value chains and efficient market systems can boost the productivity and resiliency of smallholder farmers. The research has the potential to be directly taken up by the Rwandan Agricultural Board's work on market systems.

Irrigation, Property Rights and Land Markets for Resilient Growth in Rwanda and Senegal

Location: Rwanda and Senegal (River Valley)

Lead Principal Investigator: Elisabeth Sadoulet, UC Berkeley

Collaborators: European Union, IGC, Rwandan Agricultural Board (RAB), Rwanda Ministry of Agriculture, Université Gaston Berger, World Bank

Timeline: 2020-2022

Funding: $749,897 (USAID)

Description: This MRR Innovation Lab project in Rwanda and Senegal explores how stronger property rights and better functioning land and labor markets can maximize the potential of large-scale irrigation projects to generate agricultural growth and rural resilience. In Senegal, the team will combine satellite images from across the Senegal River Valley with irrigation roll-out dates and census data to measure irrigation's impacts on agricultural productivity and diversification. In Rwanda, the team will conduct an experiment that seeks to alleviate land and labor market constraints that prevent the full use of LWH irrigation potential.

Achievements: Most project activity has centered on preparing a strategy to use satellite imagery to assess land use and productivity. The team has hand-classified plots of land using a more recent and very high resolution satellite sensor and by developing an algorithm to use with Landsat images. The Senegal team has begun contacting SAED staff in order to pilot the testing of the algorithm in an area for which administrative data are available.

Capacity Building: The team has been in contact with SAED to access regional administrative data on infrastructure development and land tenure. The team is hoping that they will be able to form a partnership with SAED that will allow the continued testing and improving of the algorithm. This partnership would also hopefully allow the team to access other valuable data regarding infrastructure placement and investment. A colleague in Senegal is confident that this should happen without difficulty. Researchers have not yet engaged in any training activities

Lessons Learned: The lessons learned so far concern the design of the researchers' algorithm. For example, it is generally difficult to delineate plots using high-resolution satellite imagery. Another lesson we have learned is that it is much easier to determine agricultural activity using Landsat images during the dry season.

Presentations and Publications: Two page project launch report, "Irrigation, Property Rights and Land Markets for Resilient Growth in Rwanda and Senegal."

Theory of Change: Drafting still underway.

Impact Pathways

RESEARCH OBJECTIVES

Using both natural experiments and randomized controlled trials, this research project intends to explore how suboptimal use of irrigation capacity is associated with the weakness of property rights and the poor performance of land markets in bringing land and labor together.

ACTIVITIES

In Senegal, the team will collect and analyze data from large irrigation projects along the Senegal River.

In Rwanda, the team is rolling out an experiment to facilitate land market transactions that could alleviate land and labor market constraints and accommodate rigidity in access to family labor.

OUTCOMES

- Evidence on opportunities and constraints of irrigation systems in both Rwanda and Senegal.
- Extensive original data sets in both countries.
- Capacity development from researchers working with government agencies on monitoring and impact evaluation theory and practice.

IMPACTS

In Senegal, the MCC has invested in the Senegal Fleuve Valley and will benefit from the new evidence. In Rwanda, the Rwandan Agricultural Board is also actively engaged and interested in adopting policies that will inform the government's agricultural strategies.

Promoting Resilient Agricultural Growth with Area Revenue Index Insurance in Ghana

Location: Ghana

Lead Principal Investigator: Ashish Shenoy, UC Davis

Collaborators: The Catholic University of America, Chr. Michelsen Institute, Esoko, Rhema Tidings, University of Alabama, University of Ghana, WorldCover

Timeline: 2020-2021

Funding: $136,636 (USAID)

Description: An MRR Innovation Lab research team is building an index insurance product that insures against price variation that affects small-scale farming families as well as families who indirectly rely on stable agricultural prices. In addition to building this new type of agricultural insurance product for rural communities in northern Ghana, the team is evaluating take-up and demand that will determine the feasibility of scaling up the insurance.

The contract will follow from one currently in development by the MRR Innovation Lab. It will feature a satellite-based yield or rainfall measure with an audit provision that allows communities to request on-the-ground yield measurements to supplement satellite data. This index will be developed separately for each of the four primary crops in the study region: maize, soybean, cowpeas and groundnuts.

Achievements: There have been delays due to covid-19 but the researchers have still been able to make progress building out the insurance contract structure. The team has confirmed the availability of the necessary data for three crops across 10 years that will help with contract design for their target area of Northern Ghana.

Capacity Building: There have been several virtual meetings between the researchers and stakeholders within the insurance sector allowing the team to conduct ground-truthing exercises to better understand the concerns of the companies around the concept of crop price insurance.

Lessons Learned: While working through the contract design, the team has been learning more about how to set the correct reference prices, and how best to best to predict a reference point in the future. The team has also acknowledged the difficulty of setting the premiums against overfitting risk, and picking the ideal sales window for the product.

Presentations and Publications: Two-page project summary, "Promoting Resilient Agricultural Growth with Area Revenue Index Insurance in Ghana"

Theory of Change: Drafting still underway.

Impact Pathways

RESEARCH OBJECTIVES

Evaluate agricultural insurance based on area revenue in northern Ghana. The research will also test a product that will insure total agricultural revenues for producers as well as broaden the market for agricultural insurance to those who do not have a crop to insure, but whose livelihood is reliant on agriculture.

ACTIVITIES

- Development new insurance products and market them over a mobile phone platform.
- Integrate yield and price indices into product design.
- Run farmer surveys to create a new insurance product.
- Market new products to producers and laborers
- Pilot strategies around marketing and communications to effect product take-up

OUTCOMES

This feasibility study will provide concrete numbers about take-up and demand that will allow researchers to fine turn or reconfigure their insurance products and interventions. Relationships between the researchers and their partners will set the stage for future scaling.

IMPACTS

This feasibility study will inform the researchers and partners so that a successful intervention can be taken quickly to scale with maximum development impacts on mitigating agricultural risk faced by farmers and laborers in Norther Ghana. It will also inform the nascent field of indexed price insurance products.

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