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

INNOVATION FOR DATA-DRIVEN AGRICULTURE

Key Findings Report | April 27-28, 2017 | Boulder, CO

I. Overview and Next Steps

The United States Agency for International Development (USAID), in collaboration with the Sustainability Innovation Lab at the University of Colorado, Boulder (SILC), hosted its second convening in a series of workshops focused on building a community of practice in data-driven agricultural development on April 27-28, 2017. The convening focused on making progress along the following objectives:

- Improve the quality of data-driven agricultural development concepts that come across the screens of funders, researchers and financing institutions
- Clarify the roles of different actors (e.g. researchers, funders, startups, etc.) in fostering more data-driven agriculture development
- Separate the hype from the real promise of data-driven agriculture in emerging economies
- Foster cross-functional teams of innovators (e.g. researchers, startups, development practitioners, etc.)

Through a series of presentations, panels and small group activities, a cross-sectoral group of 45 researchers, technology innovators, development practitioners and funders—as well as representatives from the U.S. Global Development Lab and Bureau for Food Security at USAID—explored the opportunities and challenges of data-driven approaches to agricultural development. (See Appendix 1 for resources gathered through the workshop, Appendix 2 for the workshop agenda and Appendix 3 for a full attendee list.)

KEY THEMES

Three primary themes emerged during the workshop, including 1) the opportunities and challenges surrounding data collection, analysis, open sharing and appropriate distribution, 2) the need to better understand and incorporate smallholder farmer concerns throughout the design and implementation of programs and ventures and 3) defining and engaging an "innovation ecosystem" of cross-sector actors addressing smallholder needs with data-driven approaches to agricultural development. An in-depth discussion of these themes follows in the next section.

NEXT STEPS

The primary objective of the workshop was to facilitate a cross-sector community of practice committed to innovation for data-driven agricultural development. Workshop attendees discussed possible collaborations and made individual commitments to taking

what they learned forward into future actions and conversations. Possible actions attendees discussed and committed to are:

1. Hosting a follow-up workshop, with a focus on further defining the innovation ecosystem and inviting more collaborators to the table, such as participants from the insurance industry
2. Moving forward with individual conversations started at the workshop
3. Facilitating connections between workshop attendees and colleagues
4. Exploring potential collaborative pilot engagements
5. Co-writing concept notes and best practice guides
6. Sharing applicable key documents and resources with the group
7. Hosting related webinars, hackathons and data jams
8. Initiating trial exchanges of data and/or database systems

A follow-up event to learn about the outcomes of these commitments and actions would be beneficial to supporting and building this innovative community of practice.

II. Discussion of Key Themes

1. THE DATA LANDSCAPE: DATA COLLECTION, ANALYSIS, SHARING and DISTRIBUTION

Robin Lougee, Global Research Industry Lead, Consumer Products & Agriculture at IBM Research, brought focus to the fact that 90% of the world's data has been created within the last two years. With so much data being collected and stored, the challenge lies in how we process, analyze and disseminate this data in a way that it becomes actionable. Robin also pointed out that in 2017, the combined processing power of global smartphones will surpass the processing capacity of all servers worldwide. With data collection and access at this scale and increasingly dispersed into the hands of individuals worldwide, incredible opportunities and challenges emerge relevant to smallholder agriculture in emerging economies.

a. Opportunities

Data Collection: Sensors, Drones, Satellites and More

On-farm data collection, via low cost ground sensors and remote sensors, is being incorporated into precision agriculture systems in the US to improve efficiency and crop production, which may offer analogous opportunities in developing contexts. As an example, Jeff Shaw, Water Resources Engineer at Stantec Consulting, highlighted the use of soil moisture sensors, combined with real-time weather data and on-demand water delivery, to provide optimal irrigation levels in water-scarce conditions in California. These systems facilitate up to 30% increases in crop yields while simultaneously reducing water and energy use by up to 30%.

Other opportunities for data collection via remote sensing were also highlighted during the workshop. At a local and regional scale, weather stations and unmanned aerial

vehicles (UAVs), including drones, are being used to collect information. Ani Ghosh, Project Scientist with the Geospatial and Farming Systems Research Consortium (GFSRC), presented on GFSRC's research methods, which includes the development of UAV remote sensing methods for quantitative monitoring of crop trial experiments. After collection, GFSRC compares their UAV remote sensing data with traditional field data collection techniques in developing countries. They also compare available multispectral sensors and platforms to innovate best practices for the use of unmanned aerial systems (UASs) in agricultural research.

At a global scale, Rhiannan Price, Senior Manager in the Seeing a Better World Program at DigitalGlobe, presented on DigitalGlobe's work collecting and analyzing satellite imagery. Satellite imagery allows for monitoring landscape changes over time as well as spectral analysis. This offers insights into information such as population distribution and land use, as well as crop yields and crop health through spectral analysis. Further, these methods allow for observation and analysis of food security in areas otherwise inaccessible due to conflict or other crises, as in Syria and South Sudan. Analysis is additionally aided by DigitalGlobe's use of crowdsourcing, through their platform Tomnod, to quickly identify items of interest within satellite imagery. Crowdsourcing results are then also used to train machine learning algorithms to improve the accuracy of automated object identification.

Increasing Smartphone Use + Simulation Modeling

In a developing country context, smartphone use is expanding in many regions. According to data from GSMA Intelligence, within the focus countries of the U.S. Government's Feed the Future initiative, smartphone adoption increased an incredible 800% between 2010-2015. Smartphones offer the potential for on-farm data collection, processing and cross-referencing with existing databases—in one device.

One example presented was the Land Potential Knowledge System (LandPKS), a mobile application that performs digital assessment of site vegetation type, cover and other factors needed for environmental monitoring and obtains on-farm location and soil data, cross-referenced with global soil databases, to produce a high resolution estimate of local soil characteristics. In doing so, LandPKS reduces uncertainty of on-farm soil type(s) and reduces the need for expensive lab analyses of soil properties. LandPKS results are currently being used at East African test sites to predict factors such as potential crop yield, soil erosion risk and drought vulnerability of different soils. The output can also be incorporated into other applications via open Application Programming Interfaces (APIs) to provide additional information to farmers.

Machine Learning and Predictive Analytics

Machine learning and predictive analytics were discussed for their ability to capture existing information and generate predictions where gaps in site-specific information exist. Machine learning offers the promise of a continuously improving prediction system where new observations of on-site characteristics are assimilated into analytical frameworks to improve future model predictions. Similarly, new "predictive analytics" offer great promise to help address data gaps and improve data quality. For example,

predictive analytics are currently being used in weather prediction in areas where on-site weather stations are absent. As an example, one participant in the convening, aWhere, is applying their weather modeling and prediction in combination with agronomic modeling to offer recommendations to farmers on potential pest and disease crop stress, production forecasting and more.

b. Challenges

Data in agricultural development remains a challenge. Some data is not available at the resolution needed. (E.g. High resolution is lacking for observed weather data and information on agricultural yields.) Other data is of variable, inconsistent, or of poor quality. (E.g. Data is lacking for on-farm management activities in many locations.) Lastly, collected data may not be of use to stakeholders or researchers if it lacks relevance or if it is not collected with actionable information for sharing to allow for use in a broad range of contexts. (E.g. Metadata is often lacking—which provides the key information on how data is organized and its relevance and is critical for easily finding and using data for analysis.)

Spatial and Temporal Complexities of On-Farm Decision-Making

New technologies such as machine learning, simulation models and predictive analytics are promising but do not replace the need to document and understand the complexities of smallholder farmer decision-making. In many cases such technologies require information from farmers on crop selection, the timing of planting, the use of fertilizers and other key decision points. On-farm observations provide the most direct insight into the successes and failures of crops over time and across space. If such data is captured, it greatly improves the accuracy of data-driven analytical frameworks. As such, there is a clear need to collect accurate on-site information about agronomic properties and practices to provide the ground truth and locally-specific knowledge for farmers. This need may grow more acute as new analytical capabilities come online.

Making Data Actionable: Standardized Data and Data Sharing

Once data is collected and processed, in order to make information actionable, timely sharing and dissemination through appropriate channels is required. Workshop attendees discussed the need for faster agricultural data sharing at scale. Ways of aiding data sharing discussed included 1) sharing data promptly, 2) sharing metadata and 3) standardizing and organizing data in a way that supports analysis. Generally, there is an ethos of sharing, but the data being shared is often delayed and is shared following different approaches. As data collection innovations proliferate and databases grow, there is an increasing need for standardized data and open sharing platforms to reduce redundancy, facilitate collaboration and make information actionable for smallholders.

Addressing Data Security & Smallholder Privacy, Equity and Data Access

Importantly, as we focus more closely on applying these technologies with smallholder farmers globally, questions of how to best collect and distribute accurate and secure information that addresses individual privacy and equity concerns contributes more layers of complexity. Fundamental questions, such as “Do smallholders benefit from the

analysis of data that they provide and/or collect?" need to be addressed from the outset of projects and ventures. Additionally, identifying appropriate channels for sharing and engagement with smallholders remains an active challenge. More on identifying, understanding and responding to smallholder needs and concerns, as well as appropriate channels, is detailed in the following sections.

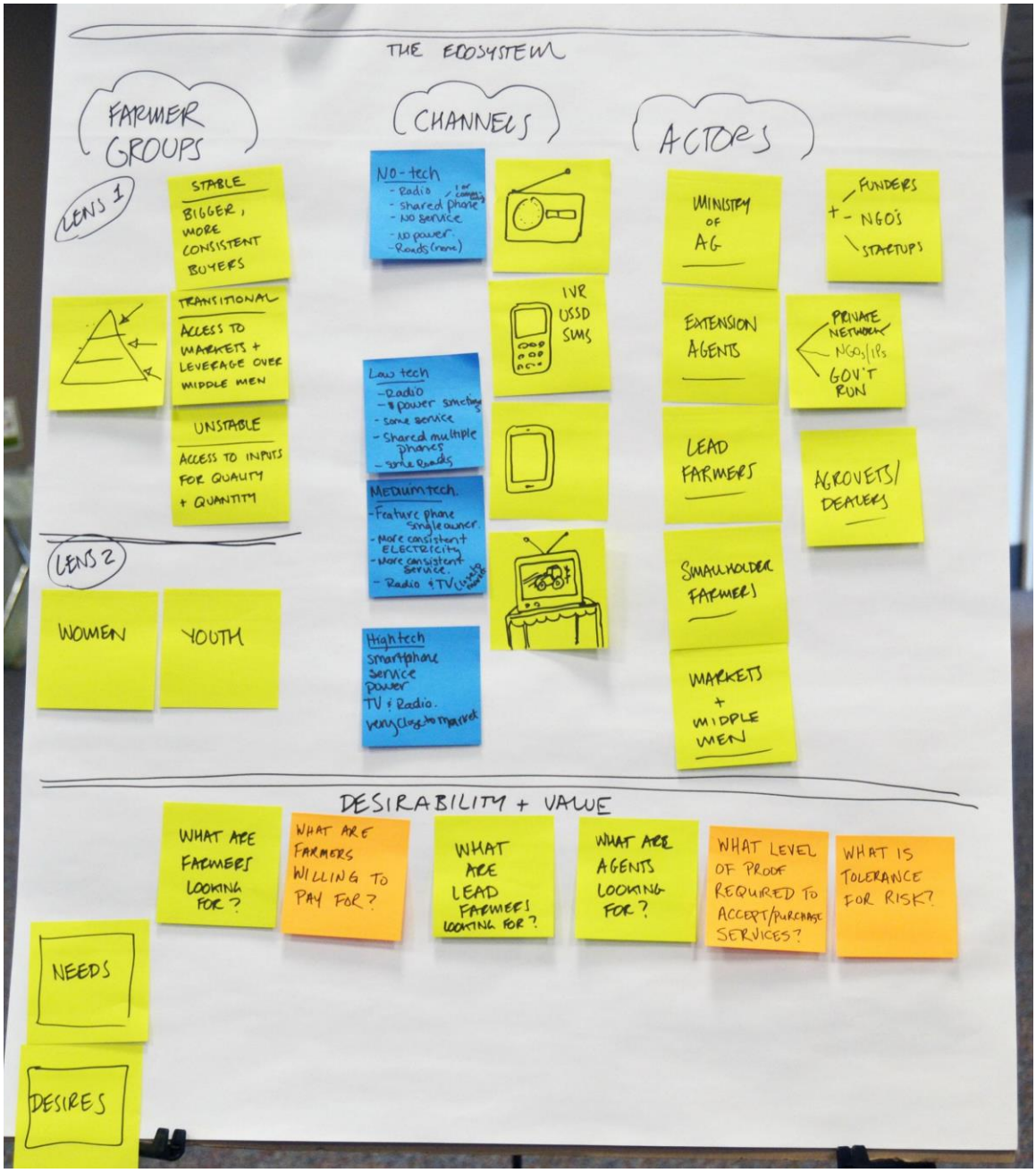
2. SMALLHOLDER FARMER NEEDS & CONCERNS

As attendees discussed technological advances and opportunities for collaboration, many commented on the need to frame research, programs and ventures within a firm understanding of smallholder needs and concerns. Within basic research, researchers often conduct data collection and analysis without an informed focus on smallholder farmer needs. Also, when initiating market-based ventures, there is incentive for technology innovators to rapidly grow and build new technologies to remain competitive in the market. But when these technologies are designed without taking the attention and time required to ground them in smallholder needs, innovators miss opportunities to provide real value to smallholder end users. And, quite often, capital incentive drives innovators toward solutions for wealthier, larger farmers.

A separate but related issue of concern voiced by attendees was a lack of feedback from farmers on their perception of information and dissemination channels. While digital technologies and channels offer an opportunity to engage smallholders at scale, many attendees expressed a desire to understand available channels, how to best employ them and how to gather farmer reactions through them. This raised the question of how to best close the feedback loop and incorporate farmer reactions into iterations of technology and information provided. In response, during small group discussions, attendees sketched out a framework of the smallholder ecosystem (Figure 1), defined smallholder profiles and identified channels available for information exchange with smallholders (Table 1).

Adam Reineck, Design Director and Studio Lead with IDEO.org, provided guidance for the smallholder ecosystem framework shown in Figure 1 and offered insight throughout the workshop on using human-centered design (HCD) to address smallholder needs and concerns. HCD is a rigorous and iterative design process employed by IDEO.org that centers on the needs of the end-user from the beginning of every project to arrive at a contextually-relevant and actionable solution. For instance, in illiterate populations, IDEO.org has employed a combination of audio and visual channels—such as interactive voice response (IVR), photography and iconography—as well as locally-relevant analog approaches—such as community events. Reaching a community through the most familiar and accessible channels, like community events, may not bring forth the most technologically advanced approach, but may be the most effective solution in a given context.

Figure 1. A Sketch of Smallholder Information Ecosystem: East Africa



Smallholder Ecosystem + Smallholder Profiles

With East Africa as a lens, attendees sketched out the data access and innovation ecosystem surrounding smallholder farmers. They framed farmer groups in terms of their needs and concerns within three main categories, 1) stable farmers, who are larger, more consistent buyers, 2) transitional farmers, who have more access to middle-men and want to know when to access markets and 3) unstable or "bottom of the pyramid" farmers, who desire access to inputs for increased crop quality and quantity. Another framing would be to consider whether farmers are women, young people, or live in rural or urban contexts.

The need to understand farmers' social and economic contexts is crucial in understanding their needs, concerns and motivations. In the least, farmers in different contexts will access data and technology differently. In a broader context, data and technology may be irrelevant if a farmer lacks reliable access to market and has no power to set prices for goods (e.g. when middlemen set prices and the market lacks competition). In this sense, the success of data and technology innovation may be tied to the amount of equity and stability in social and economic systems.

Thus, when designing a technology or choosing a channel for information dissemination, it is important to understand the full context of smallholder farmers' ecosystem, including other actors such as extension agents, agrovets, lead farmers and middlemen. Each actor is driven by her/his own needs and concerns that come into play when designing and implementing a new service or product. To flesh out smallholder profiles further and facilitate empathy, other small groups profiled potential farmers in more detail. See sidebar for an example profile.

Within the sketch of the smallholder data ecosystem, channels that farmers access for information is defined by the technology they own and the consistency of their access. For instance, a "no tech" farmer may own a radio and basic phone, but have no service plan or regular access to electricity. Whereas a "high tech" farmer may have a smartphone with consistent service, power, as well as access to television and radio. See Table 1 for an outline of current channels of communication with and between farmers.

Joseph, a 35-year-old farmer living in rural Tanzania.

Joseph is a cooperative member who has access to two acres of land where he grows maize. He also has side employment as a completing basic repairs and labor on other farms. He is married with three children. His wife is also a farmer and they live in a home with a thatch roof with some access to solar power. In terms of channels for access to information, it's important to note that Joseph is illiterate and owns a basic phone. He listens to Shamba Shakeup on the radio when he has enough power. He speaks to his peer farmers at market once a week.

Joseph's needs and concerns were listed as 1) concern about rainfall, as the climate is almost too dry to grow maize, 2) he wants to know more about nitrogen levels and how to make his farming more efficient, 3) he wants certified seeds and inputs as he has had trouble with counterfeit products before and 4) he is concerned about his children's school fees and whether he will be able to afford them. Because of his prior experience with counterfeit products and his economic context, Joseph is considered a late adopter and risk adverse.

Table 1. Farmer-Facing Information Channels

Organizations to Farmers		Farmers to Organizations
Snail Mail	Video Sharing	Bespoke Apps
Ads on Packaging	Ringback Tones	Chatbots
Demonstration Plots	Digital Financial Services	
Television	Analog Mass Media (ex: billboards)	
Radio	Trucks with Megaphone	
Reaching out to Community Leads/ Lead Farmers		
Interactive Voice Response (IVR)		

Farmer to Farmer / Organizations to Farmers / Farmers to Organizations		
Community Events	Community Theater	Social Media
Face-to-Face	Texting (SMS)	Messaging Apps

Weather Variability and Temporal Smallholder Profiles

When discussing the concerns of smallholders, it was noted several times that smallholder needs shift significantly over time. Economic concerns change throughout the year and growing season. Also, as weather becomes increasingly variable, it is important to take into account that farmers will experience extreme episodic events and related times of acute risk and vulnerability.

Digital Channels for Personalization and Timeliness of Information Dissemination

Attendees discussed the potential of digital farmer-facing channels for personalization at scale as farmers' needs change over time. Information desired will likely change depending on location and crops grown, for instance. However, by applying multiple channels of contact, one can tailor information to farmers' specific needs and keep users engaged longer. As discussed above, tailoring communications to collect feedback from farmers could also enhance and improve shared information over time.

3. DEFINING AND ENGAGING AND INNOVATION ECOSYSTEM

Attendees discussed areas of specialization and opportunities for sharing perspective, approaches and engaging in collaborations throughout the workshop. There was some discussion dedicated to defining an "innovation ecosystem"—the constellation of cross-sector actors that will best facilitate innovation in data-driven agricultural development. Sector-specific perspectives, corresponding strengths and areas of shared interest emerged. At one point, attendees self-divided according to their defined roles. See Table 2 for a sketch of actor roles, related strengths and potential gaps in expertise. One group that wasn't present at the workshop, which attendees felt should be included in discussions of increasing weather variability and seasonal risk in particular, was insurance providers.

Table 2. Actors in the "Innovation Ecosystem"

Role	Sector	Strengths	Potential Gaps
Researchers	Academia, Industry R&D, Global Research Centers (IFPRI/CGIAR)	Generating innovative ideas and approaches, Specialized agronomics/scientific knowledge	Market implementation
Funders	Incubators, Accelerators, Foundations, Government Agencies	Identifying and supporting scalable; market-viable innovations; developing business models	Incentive to invest in small-scale or high-risk ventures
Data/Tech Services	Hardware, Software, Systems Engineering	Identifying, developing and refining technology/tools	Smallholder context, needs and concerns

Implementers	Contractors/Consultants, Market-Based Social Enterprises	Partnering with local actors; launching products and services; monitoring and evaluation frameworks	Research and Development of technology/tools
Farmer-Facing Tech Services	Mobile and Digital Platforms, Information Delivery Services, Human-Centered Designers, Digital Financial Services	Smallholder context, needs and concerns; Digital and Analog information channels	Specialized agronomics/scientific knowledge

How to Build an Effective Innovation Ecosystem

While the definitions of actors and areas for collaboration has not yet been fully explored, workshop discussions could act as a launching point for building an effective "innovation ecosystem." Clear gaps discussed that will require attention going forward include 1) a research/application gap for some academic researchers and technology developers (i.e. promising tools have been developed without a clear path to market), 2) a lack of shared risk between implementing public-sector programs and farmer outcomes (i.e. success is often measured by "x number of farmers reached" vs. measurable positive livelihood impacts for farmers) and 3) a lack of incentive for funders to engage in small-scale or high-risk ventures that may be promising for smallholder farmers (i.e. funders' incentive is to invest in the fastest and highest return on investment, but this may be in conflict with agricultural cycles of risk and returns).

Funders: Impact vs. Venture Investment

An important distinction in investment incentive was identified during the workshop. While public-sector funders and private foundations often invest in innovations based on impact for farmer livelihoods, market-based investors are seeking a financial reward in their return on investment (RoI). It was recognized that "impact investment" is still relatively nascent and incentives to invest in slower-growing technologies or the seasonally fluctuating returns that occur in agriculture are lacking. If these issues are to be addressed in impact investment for agriculture, there must be new investment models that help mitigate the risk and slow returns investors face.

Appendix 1: Resources

Collaboration Resources		
Development Innovation Ventures	www.usaid.gov/div	Includes a D2FTF window for digital agricultural solutions
Grand Challenges for Development	www.usaid.gov/ grandchallenges	Engages businesses, researchers and scientists around critical development problems through partnerships, prizes, challenge grant funding, crowdsourcing, etc.
Partnering for Innovation	www.partneringfor innovation.org	Partners with private sector companies that are commercializing agricultural technologies, products and services in smallholder markets Focuses on: 1. Technology commercialization in Feed the Future countries 2. Support USAID Missions' food security goals by working with the private sector to expand or introduce agricultural products and services
FedBizOps	Fbo.gov	Primary source for government contract opportunities that are valued over $25,000 Can keyword search by agency to get a list of all USAID opportunities
Online Resources		
Global Innovation Exchange	globalinnovation exchange.org	Global online marketplace for innovations, funding, insights, resources and conversations Exchange was co-created with over 100 organizations from across government, business, academia and civil society including USAID, BMGF and PwC
Agrilinks	Agrlinks.org	Online hub where food security and agriculture professionals can contribute knowledge, learn about upcoming events and connect with other practitioners

		Offers webinars, publishes research and current funding opportunities
DAI public access gateway	www.dai.com/our-work/solutions/digital	To DAI's digital work, blog, etc.
HarvestChoice Data Resources	dataverse.harvard.edu/dataverse/harvestchoice	Datasets
	apps.harvestchoice.org/mappr	Mapping and Analysis
	harvestchoice.github.io/hc-api3	Data API
	DataAfrica.io	Visualization
Agricultural Technology Adoption Initiative (ATAI) Policy/ Research Briefs	www.atai-research.org/emerging-insights-sharing-information-to-support-smallholder-farmers	Evidence synthesis on sharing information with smallholders
	www.atai-research.org/emerging-insights-risk-mitigation-for-smallholders	Evidence on risk mitigation
	www.atai-research.org/make-it-rain-a-synthesis-of-evidence-on-weather-index-insurance	Brief synthesizing evidence on weather-index insurance, "Make It Rain"
	www.atai-research.org/protecting-farmers-from-weather-based-risk	Blog post synthesizing takeaways, "Protecting Farmers from Weather-based Risk"
	www.atai-research.org/emerging-insights-credit-and-savings-for-smallholders	Evidence on credit and savings for smallholders
	atai-research.org/emerging-insights-improving-input-output-markets-for-smallholders	Early hypotheses and areas of research on engagement with input and output markets
	www.atai-research.org/project/avaaj-otalo-bridging-the-last-mile-delivering-mobile-phone-based-agricultural-extension-in-india	Research overview of one of the RCTs that was a starting point for Precision Agriculture for Development (PAD)

Appendix 2: Agenda

Day One: April 27, 2017	
8:30 - 9:00	**Registration and Continental Breakfast**
9:00 - 9:15	**Welcome**
9:15 – 9:45	**Introductions**
9:45 – 10:45	**State of Industry Presentations with Q&A and Reflection** • *Jeff Shaw, Water Resources Engineer, MWF/Stantec Consulting* • *Robin Lougee, Global Research Industry Lead, Consumer Products & Agriculture, IBM Research*
10:45 – 11:00	**Coffee break**
11:00 – 12:00	**Lightning Talks with Q&A and Reflection (Round 1)** • *Rhiannan Price, Senior Manager, Seeing a Better World Program, DigitalGlobe* • *Jawoo Koo, Senior Research Fellow, IFPRI/ CGIAR* • *Ani Ghosh, Project Scientist, Geospatial and Farming Systems Research Consortium (GFSRC), UC Davis* • *Danielle Dhillon, Senior Program Analyst, Digital Impact Alliance (DIAL)*
12:00 - 1:00	**Lunch**
1:00 – 2:00	**Lightning Talks with Q&A and Reflection (Round 2)** • *Joe Messina, Professor, Michigan State University* • *Jason Neff, University of Colorado, LandPKS* • *Yogi Sookhu, CEO, Gotham Analytics* • *John Corbett, Chief Science Officer, aWhere*
2:00 – 2:15	**Coffee break**
2:15 – 3:15	**Panel: Farm-Facing Applications of Data with Q&A and Reflection** • *Moderator: Don Humpal, Senior Agriculturalist, DAI* • *Rikin Gandhi, CEO, Digital Green* • *Melissa Persaud, Director of Partnerships, HNI/VOTO Mobile* • *Adam Reineck, Design Director, Studio Lead, IDEO.org* • *Megan Sheahan, Director of Operations, Ag for Development*
3:15 – 4:15	**Small Group Activity: Synthesize and Debrief on Themes/Takeaways**
4:30 - 6:30	**"No Host" Networking Happy Hour at Fate Brewing Company**

Day Two: April 28, 2017	
8:30-9:00	**Registration and Continental Breakfast**
9:00 – 9:15	**Welcome Back**
9:15 – 10:30	**Small Group Activity: Smallholder Ecosystem + Profiles**
10:30 – 10:45	**Coffee Break**
10:45 – 11:25	**Small Group Activity Debrief**

11:25 – 12:25	**Panel: Funding/Innovation Landscape for AgTech Ventures with Q&A and Reflection** • *Moderator: Jason Neff, Professor, University of Colorado* • *Tyler Clark, Sr. Director of Advisory Services, Root Capital* • *Christian Merz, Senior Program Officer, Bill & Melinda Gates Foundation* • *Seth Silverman, Principal, Africa Operations Director Factor[e] Ventures, Apollo Agriculture*
12:25 - 1:25	**Lunch**
1:25 – 2:00	**USAID 101 with Q&A** • Program Analyst, D2FTF, U.S. Global Development Lab at USAID
2:00 – 2:40	**Small Group Activity: Stakeholder Mapping + Build a Team (Channels, Weather Variability, LandPKS)**
2:40 - 2:55	**Coffee break**
2:55 – 3:45	**Small Group Activity Debrief**
3:45 – 4:20	**Reflections and Commitments to Continuing the Conversation**
4:20 – 4:30	**Wrap Up Announcements**

Appendix 3: Attendee List

Name	Title	Company
Adam Reineck	Design Director, Studio Lead	IDEO.org
Amy Quandt	LandPKS Global Coordinator	LandPKS, New Mexico State University
Ani Ghosh	Project Scientist, GFSRC	University of California, Davis
Baboyma Kagniniwa	GIS Analyst	USAID
Ben Webster	Founder	17
Brandon Coleman	Civil Engineer	Stantec
Brendan Moroso	International Consultant	CGIAR
Brian King	Digital Development Advisor	USAID
Christian Merz	Senior Program Officer	Bill & Melinda Gates Foundation
Christopher Seifert	Head of Science	Apollo Agriculture
Dan Clark	Information Systems Developer	iDE
Danielle Dhillon	Senior Program Analyst	Digital Impact Alliance (DIAL)
Don Humpal	Senior Agriculturist	DAI
Eve-Lyn Hinckley	Assistant Professor of Environmental Studies	University of Colorado
Gordon Lau	Information Systems Architect	iDE
Hannah Reed	Program Officer, Agricultural Development	Bill and Melinda Gates Foundation
Heiner Baumann	Managing Director and Co-Founder	Precision Agriculture for Development
Jacklyn Ward	Business Development Manager	aWhere
Jason Neff	Professor	University of Colorado Boulder
Jawoo Koo	Senior Research Fellow	International Food Policy Research Institute
Jeff Herrick	Soil Scientist	USDA-ARS
Jeff Shaw	Water Resources Engineer	Stantec Consulting
John Corbett	Chief Science Officer	aWhere, Inc.
Jon Padgham	Capacity Building Lead	Future Earth
Joseph Messina	Professor	Michigan State University
Karina Lundahl	Facilitator and Consultant	International Agricultural Development, MS
Kiersten B. Johnson	Monitoring & Evaluation Advisor	USAID Bureau for Food Security
Kristen Roggemann	Insights + Products Manager	DAI
Leah Bridle	Senior Program Associate	Center for Effective Global Action (CEGA)
Leo Tobias	Director, Technology and Product	Grameen Foundation
Megan Sheahan	Director of Operations	Precision Agriculture for Development
Melissa I Persaud	Director of Partnerships	HNI/VOTO Mobile
Michael Bertosh	Director of Engineering	Gotham Analytics
Nikki Brand	Program Analyst, D2FTF	US Global Development Lab at USAID
Peter Richards	Economist	USAID
Raj Khosla	Professor	Colorado State University
Rhiannan Price	Senior Manager, Seeing a Better World Program	DigitalGlobe
Rikin Gandhi	CEO	Digital Green
Robin Lougee	Global Research Industry Lead, Consumer Products & Agriculture	IBM Research
Seth Silverman	Principal, Africa Operations Director	Factor[e] Ventures, Apollo Agriculture
Thomas Gibb	STIP Advisor, Center for Agency Integration & Lab Ebola Team	U.S. Global Development Lab at USAID

Tyler Clark	Sr. Director of Advisory Services	Root Capital
Whitney A Gantt	mAgri Mobile Solutions Specialist	Beyonic
Yogi Sookhu	CEO	Gotham Analytics
Zachary Baquet	Senior KM Advisor	USAID