



PRECISION
AGRICULTURE
FOR DEVELOPMENT



2017 ANNUAL REPORT



PAD ANNUAL REPORT

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WHO MAKES OUR WORK POSSIBLE

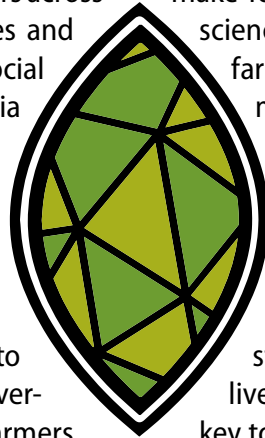
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LETTER from the MANAGING DIRECTOR

Dear friends,

As I reflect on 2017, PAD's second full year of operations, I am delighted to share that we increased our farmer reach more than tenfold, three times our target, to 345,000 farmers across three countries. A combination of new technologies and the latest insights from behavioral economics and social learning makes it possible for us to deliver services via mobile phones that transform the way farmers learn and make agricultural management decisions. PAD works to improve livelihoods and empower millions of smallholder farmers who collectively produce the majority of food consumed in developing countries.

As the risks and complexity of farming grows due to climate change, new pests, and an increasingly overwhelming array of seeds, fertilizers, and pesticides, farmers truly benefit from customized agricultural advice. For many farmers, having a food-secure home or sufficient income to pay for daily necessities depends entirely upon making informed decisions in their fields.



During the year, I was fortunate to visit several of PAD's sites where I witnessed the critical difference our service can make for smallholder farmers. I saw firsthand that without science-based advice, farmers often revert to suboptimal farming practices, especially when they have little formal agricultural training and very limited cash. However, when information is accessible, farmers are able to improve their practices and, in turn, their incomes.

The PAD team is well-positioned to progress on our path towards impact at scale. Continuing to attract and retain top talent, learn and adapt quickly, and stay focused on understanding the needs of and delivering value to farmers at ever-decreasing costs will be key to our success in 2018 and beyond.

We are deeply grateful for the support of the funders and partners who make this work possible.

A handwritten signature in black ink, appearing to read 'H. Baumann', with a long horizontal line extending to the right.

HEINER BAUMANN



PAD

AT A GLANCE

2017

We are working on a new model for agricultural extension: reaching farmers with personalized agricultural advice through their mobile phones. We implement this model in collaboration with partner organizations and governments and gather evidence of its impact. We aim to improve the lives of 100 million farmers in developing countries with our services and support to existing systems.

Using two-way communication and information aggregation, we offer farmers useful information customized by geography, market, and farmer characteristics. As farmers realize the benefits of this service, they have incentives to contribute accurate information into the system that will improve our recommendations over time. We incorporate insights from behavioral economics and social learning theory and aspire to make extensive use of A/B testing and machine learning techniques designed to identify what types of information and delivery mechanisms work best for farmers.

LABS

Through PAD labs we design and operate on-going services for farmers or implement research projects and pilots. These spaces serve as “sandboxes” for us to rigorously test ideas while providing valuable information to farmers.

PARTNERSHIPS

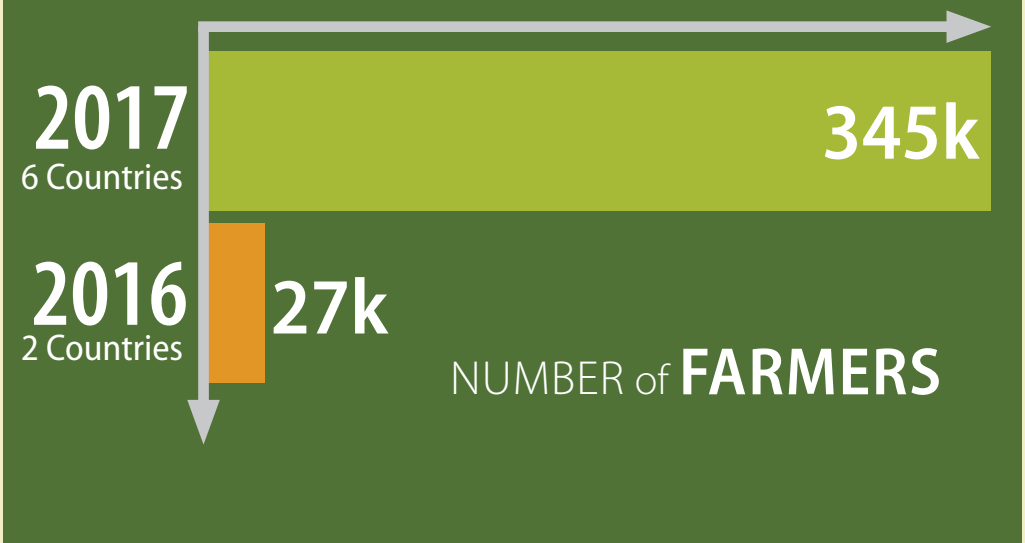
Through our partnerships we scale ideas that work and experiment with large groups of farmers. Here we partner with governments and organizations with a shared vision of building, operating, and evaluating a service for farmers.

PAD: year in review



How do we define "Farmer Reach"?

We count any farmer who has received valuable agricultural advice through their mobile phone on account of PAD. Some of these farmers are long term subscribers to a service, like what we offer through Krishi Tarang in India, while others receive advice from research pilots or short term campaigns, like through some of our earlier work with One Acre Fund.



2017 by Month

JANUARY

Rolled out a randomized controlled trial (RCT) with nearly 6,000 maize farmers across Western Kenya

APRIL

Initiated our first government partnership in Punjab, Pakistan

JUNE

Launched a pilot service in Odisha, India with ambitions of reaching 1 million rice farmers in partnership with the government

JULY

Started an assessment of nationwide mobile advisory service in Ethiopia, which included extensive A/B tests

AUGUST

Designed a trial at scale for 200,000 One Acre Fund farmers in Rwanda

SEPTEMBER

Reached 50,001 farmers with PAD's service in Gujarat, India

NOVEMBER

Completed a scoping visit for building a service for palm oil farmers in Ecuador



In 2017, our second full year of operations, we grew our team to 90 members, added 4 new countries to our portfolio, brought our Gujarat service to another state in India, performed scoping work on a new continent, formed partnerships with 4 governments, designed and launched over a dozen RCTs and A/B tests, and deepened our engagements with 2 NGOs and 2 agribusinesses.

MONITORING & IMPACT

PAD was founded with an eye towards data-driven implementation, constant experimentation, and rigorous impact analysis.

To that end, we place considerable emphasis on integrating A/B tests into daily operations while working towards services that can be evaluated using randomized controlled trials (RCTs) and other methods.

This year, we made significant progress towards building the research base around the potential for digital agriculture while reinforcing our strength as an evidence-forward organization.


What is our FOUNDATIONAL IMPACT EVIDENCE?

Two RCTs implemented before the inception of PAD guided our initial service offerings. This research was conducted in part by development economists Shawn Cole and Michael Kremer, two of PAD's co-founders.

In India, access to a customized voice-based agricultural advisory system increased farmers' marginal net income by an estimated \$100/year/farmer and yield by 8.6 percent for cotton and 28.0 percent for cumin, all at a cost of less than \$10/year/farmer.

In Kenya, sending SMS messages with agricultural advice to sugar cane farmers increased yields by 11.5 percent in one trial and reduced fertilizer delivery delays by 21.6 percent. In a second trial, there were no significant yield gains.

These studies established the groundwork for continued impact assessments completed by PAD that, together, show the value and potential of mobile phone-based agricultural extension.



What do we monitor?

Having ICT-enabled systems means that PAD can monitor system usage and interaction at any time. These statistics – including pick-up rates, listening duration, number of messages into a Q&A service, number of peer referrals, farmer rating of content, etc. – provide insight into farmer demand, acceptance, and satisfaction with system offerings. In Gujarat, India alone, the average pick-up rate for our service was over 82 percent and users rated the content an average of 4.45 out of 5.

How do we measure impact?

Our ultimate interest is in increasing farmers' yields and incomes. Where possible and appropriate, we use RCTs and A/B tests to assess the impact of systems on these outcomes. In other instances, we collect measures of behavior change, an intermediate outcome, and estimate changes in yield and income by combining with secondary data or other research. This year, we designed or implemented 2 RCTs in Kenya, 1 in India, and 1 in Rwanda.

What's an A/B test?

A/B testing is a method of comparing two versions of a service feature or content offering to determine which works best. Half of the sample receives option A, the other half option B, then we compare outcomes. At PAD, we are generally interested in outcomes specific to farmer engagement and behavior change. This year, we conducted 5 A/B tests in India and 4 in Ethiopia.

How else do we measure our influence?

We also seek to change the larger conversation around mobile phone-based agricultural extension through dissemination of our research findings. This year, members of our team made 20 presentations that reached over 1,200 attendees. These presentations and follow up discussions have led to real policy influence with governments and NGOs around the world.

KRISHI TARANG AS A TESTING SPACE

We are full of ideas about how to make mobile phone-based agricultural extension work better for farmers. Having grown our voice-based Krishi Tarang service to over 50,000 farmers in Gujarat alone, this system and set of farmers served as a valuable testing ground for some of our ideas in 2017.

This year we conducted four main A/B tests via Krishi Tarang. In one, we examined whether farmers listened to more content if they received just one long call per week or two shorter calls over two days. In another, we explored whether personalizing the greeting at the beginning of weekly calls with a farmers' name would encourage them to listen to content longer and have more trust in the recommendations. Both trials relied on data automatically collected through the system – whether farmers pick-up, and for how long they listen to a message – to analyze the effectiveness of each scenario. In other tests, we also collect data related to how farmers change their practices based on the information we send. For instance, in another A/B test, we offered some farmers information about cumin production and others not, then assessed which group was more likely to plant cumin, a higher value crop, which involved follow up interviews with farmers.

Apart from simple A/B tests, we continue to rely on larger scale RCTs to explore more complex questions. Of great interest to PAD – in India and around the world – is how best to provide farmers with customized fertilizer management advice tailored to accurate data about their soils. With funding from the Agricultural Technology Adoption Initiative, we spent the year investigating best practices around incorporating soil fertility information and fertilizer advice into mobile phone advisory systems. Given interest by many regional governments in providing farmers with physical “soil health cards” that contain similar information, we also helped to optimize the design of these cards as well as find ways to complement their distribution with mobile phone-based messages.



“I received the Krishi Tarang service number on advice from a farmer friend. After joining the service, I feel that I am getting correct and timely information for my crop. I believe it is very useful information for farmers like me.”

Ahshok, cotton farmer in Gujarat, India

PARTNERSHIPS in INDIA



Field enumerators learn to sample soil for testing.



Farmers provide feedback on what content offerings would be useful.



PAD's Lead Agronomist in India conducts a focus group among farmers.

IFFCO-Kisan

We partner with IFFCO-Kisan, a mobile phone advisory service that reaches more than 3.5 million farmers across 19 Indian states, to evaluate and upgrade their system. Despite IFFCO-Kisan's wide reach, they realized that farmer engagement with the system and impact on behavior change could be improved. PAD analyzed their system data from two districts in Gujarat across three years and met with a subset of these farmers through field visits to better understand how they interact with the service. Based on this evaluation, we proposed several changes to the system to meet their goals. IFFCO-Kisan already has made changes to its operations on account of PAD's recommendations and plans to work with us to build dynamic farmer profiles based on usage statistics in order to increase the customization of its advice.

AgroStar

This year, we added AgroStar, an Indian agribusiness with a customer base of around 1.1 million farmers, to our portfolio of partners. AgroStar sells inputs to farmers through an online platform and was interested to explore how offering advice to farmers through an advisory service would lead to more sales. With a sample of 6,000 farmers, we are testing various methods of sending agri-advisory messages and advertisements to farmers for their effectiveness in generating leads for AgroStar while promoting critical inputs to farmers. Our initial evidence suggests that farmers are more likely to pick up advisory calls when they come from PAD, showing the potential of offering the service together. This represents one of PAD's first explorations of a revenue generation model with agri-business.



Far from the cotton fields in Gujarat are the paddy fields of Odisha, the next destination for PAD's expansion in India. Taking best practices from operating Kri-shi Tarang, this year we piloted a voice-based service with 5,900 rice farmers across two districts of Odisha, Puri and Balangir, in preparation for offering a service at scale. Starting in 2018 and with the support of the Bill and Melinda Gates Foundation, PAD will partner with Odisha's Department of Agriculture and Farmer Empowerment to build a customized mobile phone-based agricultural advisory system that makes use of existing

government resources, data, networks, and infrastructure with the goal of reaching 1 million rice farmers by 2020. Simultaneously, we also partnered with the International Rice Research Institute to provide customized content on soil nutrient management via mobile phones. With the goal of eventually reaching 25,000 farmers with this content, we piloted push calls with 5,000 farmers in 2017. We are excited to be supporting farmers via our partners in a new landscape full of new challenges and means of customizing agriculture information.

EXPANDING to ODISHA, INDIA

STORIES from **THREE** FARMERS

Through our work in Odisha, our team met three farmers with adjacent plots in the village of Denua – one subscriber to the PAD service and two nonsubscribers – to hear how they were weathering an infestation of a pest called brown planthopper as well as heavy rains and flooding.



Lingaraj Swain

After a tour of his lush green rice paddy, we sat down for tea with Lingaraj Swain, a PAD farmer who methodically follows our recommendations. Lingaraj recounted how his daughter transcribes PAD's weekly message for him so he can continually refer to the information. Since joining the PAD service, he estimated a 25 percent increase in yield, despite some crop damage, and a 50 percent reduction in the fertilizer he purchased, together increasing his net income.

Lingaraj's neighbor and fellow rice farmer, Santanu Pradhan, observed brown planthopper on his crop. Santanu is not a subscriber to PAD's service and thus did not benefit from the advice PAD provided about appropriate practices for



managing the pest. Unfortunately in his attempt to rid his crop of the pests, he applied a generic weed killer instead of a rice pesticide, damaging a tract of his plot. Luckily he only applied the weed killer 0.2 acres of his paddy, but the section was unsalvageable. As a result, his yield was about 25 percent less than his neighbor's, PAD farmer Lingaraj Swain.



Damaged Tract

Binod Jena, another neighboring farmer, is also not participating in PAD's advisory service. He also reported yields 24 percent less than other nearby PAD farmers.

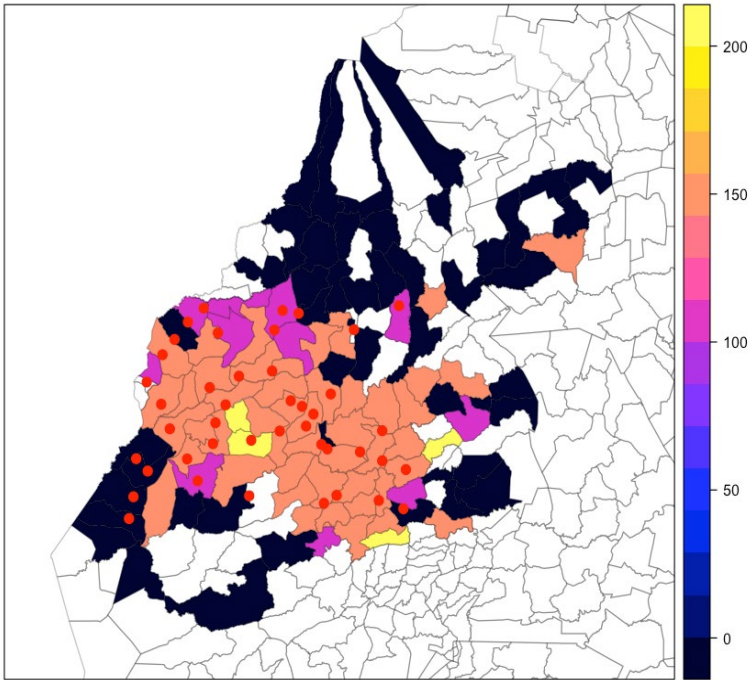
While this information is anecdotal, it complements what we find elsewhere in our more rigorous impact evaluations. With one season of operating in Odisha under our belts, we are encouraged to see marked results in person and hear the enthusiasm and hope in the voices of the farmers we serve.

GROWING the EVIDENCE BASE and SCALING IDEAS in KENYA

This year was about building our evidence base around the potential for mobile phone-based agricultural extension and scaling through partnerships in Kenya. Drawing on our pilot with 1,800 farmers the previous year, in 2017 we launched a randomized controlled trial among nearly 6,000 maize farmers to explore how providing farmers with customized agricultural lime and fertilizer recommendations through their phones would change their input management choices.

Our results were incredibly promising. Farmers who received messages encouraging lime use were 25 percent more likely to purchase lime and purchased 27 percent more. Farmers who received messages encouraging them not to use lime were 33 percent less likely to purchase lime and purchased 44 percent less. We were able to move many farmers to locally appropriate soil amendments drawn from high-quality soil data with simple SMS messages.

This evidence, combined with similarly favorable findings from research done in partnership with One Acre Fund, caught the ear of the Ministry of Agriculture, Livestock, and Fisheries in Kenya (MoALF). Kenya, like many countries in Africa, is battling the invasive Fall Armyworm (FAW) pest. The MoALF sees great promise in using a PAD-like system to get the word out to millions of smallholder farmers across Kenya about how to identify and combat FAW. While working with Safaricom on the design of the system, we collaborated with partners from the Centre for Agriculture and Biosciences International (CABI) to assemble content and pilot a service among farmers in Western Kenya. The learnings from this work will inform the system design and offerings of a nationwide campaign in partnership with the government in 2018.



Agricultural lime recommendations (kg/ha) by ward in Western Kenya sent to farmers via SMS during RCT. Red dots are market centers. Map by Giulia Zane.



Fall Armyworm. Photo by Daniel Adjokatcher, CABI.

KENYA: FARMER TESTIMONIALS



In Western Kenya, we pilot and test ideas we hope to scale with our partners. During the short rains season in late 2017, we set up a two-way phone-based question and answer service and invited questions on a range of topics. After the season ended, we followed up with some of the farmers who used the service to collect their feedback.

“My maize leaves were turning yellow, so I asked PAD what to do. They replied that I should mix CAN [calcium ammonium nitrate] and urea fertilizers to apply to my maize. After applying them, the leaves turned green again.”

Baroness Wanzala, maize farmer in Kenya

“I asked PAD how to use lime at planting and how to get rid of pests. I followed the recommendations and increased my maize yields.”

Jerita Wanyama, maize farmer in Kenya

“I asked a question about maize, and the answer helped increase my harvest.”

Elizabeth Akinyi, maize farmer in Kenya



DEEPENING OUR PARTNERSHIP

Mobile phone-based advisory systems need not operate in a vacuum. We also see great potential in coupling in-person extension with mobile phone services. That's what makes us so excited about our partnership with One Acre Fund. With a model around offering training and financing to smallholder farmers, One Acre Fund is now working with 500,000 farmers and is interested in combining their high touch in-person efforts with lower touch mobile-based ones.

PAD worked with One Acre Fund to design, implement, and analyze the data from several experimental trials in Kenya and Rwanda around delivering messages to farmers through SMS. In 2016, a trial with 5,000 farmers in Kenya found that farmers who received SMS messages encouraging them to use agricultural lime were 28 percent more likely to purchase through One Acre Fund.

Building on the results of this promising trial, we helped One Acre Fund launch expanded trials with 40,000 farm-



with **ONE ACRE FUND**

ers in Kenya and nearly 200,000 farmers in Rwanda where we experimented with message design and encouraged farmers to share advice among peers. Here we are directly testing some of the latest thinking in behavioral economics and social learning theory.

Beyond these trials, we are also helping One Acre Fund absorb this culture of experimentation into their operations. In Kenya, communicating with farmers through phone messages is now becoming a norm for the organization and, at PAD's encouragement and with our facilitation, they are using this platform to experiment with message design, frequency, timing, etc. at scale.

One Acre Fund's wide farmer network is an exciting one within which to experiment. PAD looks forward to further testing and helping One Acre Fund bring impactful ideas to their operations and farmer clients.



"ICT solutions for improving agricultural extension have great promise, and PAD is at the forefront of investigating these benefits through rigorous experimentation. One Acre Fund is delighted to work with PAD researchers on trials for supplementing our current Field Officer based extension model with mobile phone delivery of customized information.

We really respect that PAD combines rigorous measurement of impact, together with our shared passion for scale. PAD researchers are focused on incredibly scalable interventions that deliver a meaningful level of impact for the farmers that we serve."

Andrew Youn, Co-founder and Executive Director, One Acre Fund

SUPPORTING EXTENSION 2.0



in PUNJAB, **PAKISTAN**

PAD was invited by the Government of Punjab in Pakistan (GoPb) to provide expertise in ICT-based extension systems with a goal of reaching 5 million farmers with digital agriculture by 2022. The GoPb is at the forefront of searching for ways to increase their interactions with farmers through mobile solutions, and PAD is delighted to partner around effective solutions.

What does that mean in practice? To start, PAD helped the GoPb to redesign physical soil health cards (SHCs), which contain information on local soil nutrients and fertilizer recommendations, to maximize farmer comprehension and uptake of advice. When our partnership was initiated, the SHCs were not accessible to farmers with low levels of literacy and numeracy. Through discussions with farmers that focused on human centered design practices, PAD helped the GoPb to create more actionable cards that included pictorial representations of the recommendations. The SHCs will be rolled out systematically to all farmers starting in early 2018.

Our work in India has taught us that these SHCs are much more likely to be used and understood by farmers if their distribution is coupled with similar messages delivered through phones. In parallel to improving the SHC design, the PAD team co-designed with the government a complementary IVR system with aims to roll out in 2018. While the system will initially focus on customized soil fertility and fertilizer management advice, it will also facilitate a two-way question and answer service modeled after our Krishi Tarang system.

“Our collaboration with PAD is to help us apply evidence-based best practices for effectively reaching out to farmers with the aid of ICT. With deep research capabilities and experience running customized information services for farmers elsewhere, we are confident that PAD is very well positioned to support our efforts.”

Muhammad Mahood, Secretary of Agriculture Department, Government of Punjab

This initial work in Pakistan has demonstrated the value of PAD’s global network of connected systems. We are taking lessons learned from our work in India and Kenya and bringing them to life with a partner capable of significant scale in Pakistan. We can’t wait to see where this partnership goes in 2018.



(left) Citrus farmer Liaquat Jalap sees great potential in a mobile phone agricultural advisory service that provides customized information on input and pest management. (above) Mr. Jalap’s daughters, Mahreen and Kiran.

زمیندار کا نام _____ شناختی کارڈ نمبر _____ رپورٹ کی تاریخ _____

موبائل نمبر _____

نمبر	آکسیجن	نٹروجن	فاسفورس	پتاش	سولفور	کلورین	سیلیسیم	میکرو	پتاش	سولفور	کلورین	سیلیسیم	میکرو
0.2 سے 0.5	0.5 سے 1.0	0.1 سے 0.2	0.1 سے 0.2	0.1 سے 0.2	0.1 سے 0.2	0.1 سے 0.2	0.1 سے 0.2	0.1 سے 0.2	0.1 سے 0.2	0.1 سے 0.2	0.1 سے 0.2	0.1 سے 0.2	0.1 سے 0.2
0.5 سے 1.0	1.0 سے 1.5	0.2 سے 0.3	0.2 سے 0.3	0.2 سے 0.3	0.2 سے 0.3	0.2 سے 0.3	0.2 سے 0.3	0.2 سے 0.3	0.2 سے 0.3	0.2 سے 0.3	0.2 سے 0.3	0.2 سے 0.3	0.2 سے 0.3
1.0 سے 1.5	1.5 سے 2.0	0.3 سے 0.4	0.3 سے 0.4	0.3 سے 0.4	0.3 سے 0.4	0.3 سے 0.4	0.3 سے 0.4	0.3 سے 0.4	0.3 سے 0.4	0.3 سے 0.4	0.3 سے 0.4	0.3 سے 0.4	0.3 سے 0.4

رہائش _____

تاریخ _____

زمین کی صحت کا کارڈ

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موبائل نمبر _____

سفارشات کھاد فی ایکڑ

کھاد فی ایکڑ	یوریا (نائٹروجن)	ڈی اے پی (فاسفورس)	ایس او پی (پتاش)
گندم			
کپاس			
چاول			
مکئی			
کھاد			

اضافی مشورہ _____

SOIL HEALTH CARDS

Through discussions with farmers and informed by our work in India and Kenya, we partnered with the government to redesign their soil health cards (**top**) to increase their impact. Changes included: using pictorial representations of quantities instead of numbers, printing instead of handwriting, adding color, and moving the recommendations from the back to the front of the card (**bottom**).

in ETHIOPIA

We like working at scale. So when presented with the opportunity to evaluate a mobile phone advisory system offered nearly nationwide by Ethiopia's Agricultural Transformation Agency (ATA), we quickly jumped on board. To date, the ATA's IVR/SMS and hotline system have serviced over 3 million farmers via over 25 million calls, representing the largest system of its kind in Africa. And, with over 13 million smallholder farmers in Ethiopia, the system has the potential to serve even more.

Our initial task was to identify potential means of increasing farmer engagement with the system and the impact of recommendations. To arrive at these suggestions, we implemented a three-part small-scale evaluation of the existing service.

First, we analyzed data from 50,000 farmers already collected by the system. This included a range of usage and engagement statistics that offered a picture of how farmers navigate the system and how often. Then, we talked with 2,000 farmers and other system users about their experiences, guided by the results of our analysis of system data. Finally, we worked with ATA to test hypotheses about how to improve engagement through 4 A/B tests that treated over 260,000 system users.

HELPING the ATA TAKE THEIR MOBILE SYSTEM to the NEXT LEVEL

What did we learn? Farmers have tremendous demand for this service, and highly cost-effective radio campaigns have been instrumental in getting the word out. But, room for improvement exists. Our discussions with users suggests that the content – while scientifically rigorous – is often presented in an overly technical manner and is not actionable for farmers. And, even the process of getting to the content – through complex menus – can be a deterrent to finding the information they need.

Our results directly contributed to discussions with the ATA about how to upgrade their system. Some of the suggestions could be implemented now, while others required further investigation through additional A/B tests and other experimentation. The ATA expects to significantly expand its system by 2020, and PAD looks forward to working in partnership to help them meet their goals of offering world class and impactful advice to smallholder farmers.

(left) Women collecting water for seedlings in Bete Gabriel, Tigray.
(right) Three types of data and analysis used in our preliminary assessment of the ATA's existing mobile phone advisory system.

A/B TESTING

The screenshot shows a database console with several SQL queries and their results. The queries include:

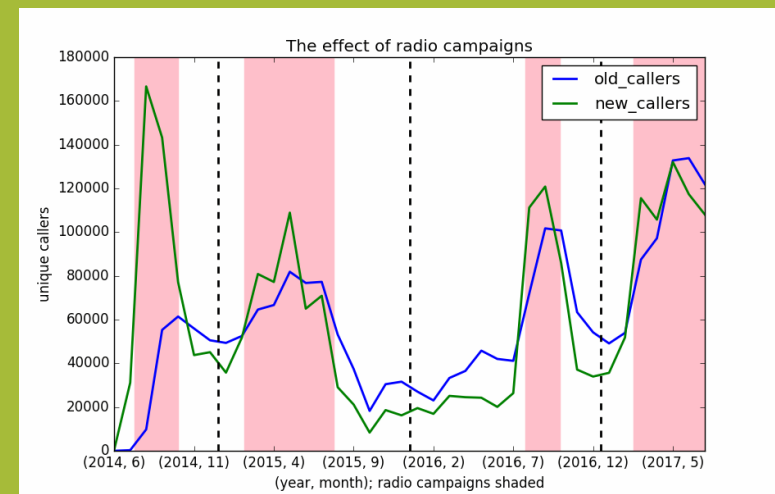
```

SELECT * from tblExperimentProcess;
SELECT current_timestamp();
# WARNING: QUERY TO CHANGE TREATMENT THRESHOLD!!
insert INTO tblExperimentProcess (experimentId, updatedBy, treatmentThreshold, experimentName, experimentSample, comments)
# VALUES (101, 'Ofir Reich', 0.02, 'No Profile Registration', 'New users', 'Ramping up to 2% - 10 users till end of day');
SELECT * from tblExperimentAssignment WHERE assignmentTime > 2017-11-07 13:57:05;
SELECT * from tblCallLog where callerId=3135642;
    
```

The results table shows the following data:

id	callerid	eventTime	loginfo	loginfold	
1	16651735	3135642	2017-11-07 14:15:06	Caller Part of Experiment Sample - Treatment	371
2	16651737	3135642	2017-11-07 14:15:07	Incoming call started	162
3	16651765	3135642	2017-11-07 14:15:12	Welcome message played	1
4	16651801	3135642	2017-11-07 14:15:18	Language Menu - Oromiffa language selected	6
5	16651872	3135642	2017-11-07 14:15:35	The caller hung up the phone	32

IVR SYSTEM DATA



INTERVIEWS



An aerial photograph of a rural landscape in Ecuador. The foreground is dominated by large, rectangular agricultural fields, some of which are planted with crops like corn. In the middle ground, a small village is visible, featuring a prominent white church with a tall steeple. The background shows rolling green hills under a clear sky. A semi-transparent green box is overlaid on the right side of the image, containing text.

WORKING WITH **IDB INVEST** in ECUADOR

We see great promise in using agribusiness and contract farming operations as a platform to provide smallholder farmers with high quality and customized advice. These private firms have direct incentive to increase the productivity of their farmers and often collect useful data in abundance.

This year we partnered with IDB Invest to explore the potential of developing a mobile phone-based agricultural advisory system for Ecuador's largest palm oil producer, Oleana. While a two-way ICT-enabled system is the goal, PAD's first task was to conduct an assessment of Oleana's underlying data sets and data collection processes to see how they might feed into such a system. In 2018, we will work with IDB Invest to help Oleana meet its objective of better serving their farmers through mobile phone-enabled advisory systems.



INDIA
 JPAL South Asia
 Awaaz.De
 International Rice Research Institute
 CIMMYT
 AgroStar
 IFFCO-Kisan

KENYA
 Innovations for Poverty Action
 Echo Mobile
 Busara Center for Behavioral Economics
 One Acre Fund
 Ministry of Agriculture, Livestock, and Fisheries
 Centre for Agriculture and Biosciences International
 CIMMYT
 HNI/Viamo

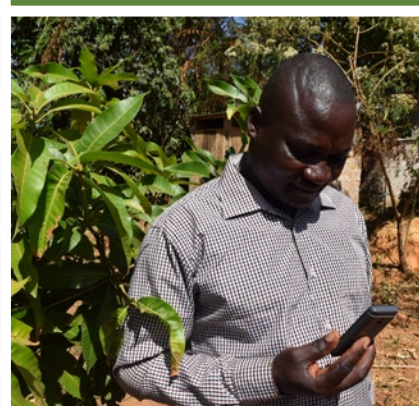
PAKISTAN
 Center for Economic Research in Pakistan
 Government of Punjab's Agriculture Department



ETHIOPIA
 Agricultural Transformation Agency

RWANDA
 Tubura/One Acre Fund

ECUADOR
 IDB Invest
 Oleana



PARTNERS

FINANCIALS

This year we spent nearly \$1.8 million across all PAD activities, 80 percent of which on our programs.

For PAD, scale and financial sustainability move in tandem. One of the advantages of mobile phone-enabled extension services is the low marginal costs of providing information to farmers. As we increase our farmer reach through partners, our “per farmer” unit costs naturally fall.

Across all geographies in 2017, and with a reach of 345,000 farmers, our unit cost was about \$5.20 per farmer, mostly due to high reach through partnerships in Kenya and Rwanda. In India, where our reach is more a function of continuously-operating PAD services, our unit cost was about \$8.25, half of the 2016 value.

Increasingly, PAD is engaging with partners who will take on the costs of implementing their services directly. In some cases these partners will also pay for PAD’s guidance. As we expand our operations and farmer reach through partners that contribute resources, PAD pursues financial sustainability and impact simultaneously.

PAD SPENDING

2017
6 Countries

\$1.8M

2016
2 Countries

\$1.2M

UNIT COST PER FARMER

2017
6 Countries

\$5.20

2016
2 Countries

\$43.93

FUNDERS

"I have been investing in promising early stage organizations for the last two decades and look at a large number of opportunities every year. PAD possess a rare combination of a high caliber team pursuing a powerful idea at the right moment in time. We have funded PAD from inception and are impressed by their work to date."

Mark Lampert, BVF Partners and Unorthodox Philanthropy

"PAD's success is reliant on a very diverse team that is located across three continents but executes with one single ambition: to customize advice for 100 million farmers."

Nina Gene, CEO, Jasmine Social Investments

Anonymous (3)

Agricultural Technology Adoption Initiative

Benckiser Stiftung Zukunft

Bill and Melinda Gates Foundation

Dioraphte Foundation

Horace W. Goldsmith Foundation

IDB Invest

Jasmine Social Investments

Mary Eliot Jackson

Mulago

Unorthodox Philanthropy



Nina Gene of Jasmine Social Investments visits PAD's team in Gujarat, India.

PAD: year in people

Global

Heiner Baumann, Managing Director
Megan Sheahan, Director of Operations
Tomoko Harigaya, Senior Researcher
Ofir Reich, Data Scientist
Jonathan Lehe, Global Research Manager
Carolina Corral, Director of Program Expansion
Victor Perez, Data Manager
Olga Rostapshova, Development Advisor
Wendy Hernandez, Admin Assistant



Team Size

2016: 67
2017: 90

Co-founders and board

Michael Kremer
Shawn Cole
Daniel Björkegren
Heiner Baumann

Research affiliates

Robert On, UC Berkeley
Raissa Fabregas, Harvard University
Vivian Hoffman, International Food Policy Research Institute
Garima Sharma, Massachusetts Institute of Technology
Nilesh Fernando, Notre Dame
Adnan Khan, London School of Economics
Lorenzo Casaburi, University of Zürich

Other

Jeff Brown, Senior Advisor
Margaret Doherty-Lopez, Interim Senior Business Development and Communications Manager
Laurie Phillips, Interim Senior Finance and Operations Manager

"PAD has a futuristic vision with a finger on the pulse of changing technology and what that would mean for digital extension services. I was impressed with the strategic flexibility and the willingness to venture into diverse directions. With an evidence-based approach, PAD is uniquely placed for solving productivity and other challenges of Indian farmers."

Rohan Parakh, intern



India

Madhur Jain, India Country Director
Tarun Pokiya, Lead Agronomist
Navendu Saxena, Director of Product
Swapnil Agarwal, Senior Research Associate
Garima Sharma, Research Associate
Veethi Vyas, Research Associate
Jaagruti Didwania, Research Associate
Meghna Singh, Research Consultant

Field staff hired through JPAL South Asia



Graduate Students

Zhengyun Patricia Sun,
Harvard University

Africa

Emmanuel Bakirdjian, Kenya Country Director
Getu Shikur, Ethiopia Country Representative
Giulia Zane, Post-doctoral Researcher
Daniel Mokrauer-Madden, Research Coordinator
Lillian Alexander, Implementation Associate
Violet Omenyo, Associate Field Manager and Agronomist
William Wanjala Oduor, Data Manager
Charles Misiati, Associate Field Manager
Chris Musungu, Field Manager
Carolyn Nekesa, Consultant

Field staff hired through IPA Kenya

Pakistan

Adeel Shafqat, Senior Program Manager
Ali Asad Rashid, Project Coordinator
Ali Bakhtawar, Research Assistant

Field staff hired through CERP

"As the descendant of Pakistani farmers - whose grandfather still operates a farm, which I will inherit a piece of one day - it was important to me to learn more about the agriculture sector and see if I could apply my skills in impact evaluation and ICT development to help the sector develop. Interning with PAD provided me a holistic sense of the agriculture value chain."

Faran Sikandar, intern

Interns

Rohan Parakh,
Harvard Kennedy School
Faran Sikandar,
Harvard Kennedy School



Empowering farmers with digital agriculture

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