

PAD Q3 2020

QUARTERLY REPORT

Precision Development

The COVID-19 pandemic has accelerated digital transitions in walks of life ranging from financial services to shopping. At the same time, the pandemic may undo decades of progress in the escape from poverty, with potentially stark, life-changing, and intergenerational effects for vulnerable communities and individuals.

At the core of Precision Agriculture for Development's (PAD) work is the scaling of cost-effective digital information services to empower poor people with knowledge to improve their lives. We know that information poverty - when people do not have access to information about knowledge and technology to inform productive decisions - is a driver of poverty. Moreover, we believe that the spread of ideas and technologies is a force behind progress in human welfare.

To date we have focussed our two-way digital information services on providing actionable agricultural knowledge to smallholder farmers. Most of the world's poorest households rely on small farms to sustain their livelihoods, and it is now possible to provide targeted, customised, actionable information very cheaply, directly to the farmer. This is proving to be an extremely cost-effective

and scalable way of bringing benefits to the world's poorest people.

In August, PAD's Board authorised the consideration of opportunities to provide information services in education and in other sectors, as well as agriculture. In September our lawyers formally changed our legal name to Precision Development (we will use the acronym PxD) to accommodate a wider range of possible activities. PAD remains our main focus and our core brand.

PxD will iterate as we learn and grow, but we will remain committed to a few core principles:

- We will continue to serve the very poor.
- We will continue to work through the combination of research, learning and iteration.
- We will maintain our focus on delivering actionable information.
- We will work to deliver our services at scale, and at low marginal cost.
- We will partner flexibly and generously to advance these ends.
- We will continue to provide agricultural advice, given how important this is for many of the world's poor.

We are in the process of finalizing a new strategic framework to guide us. We look forward to engaging with you as we systematize our thinking

about new opportunities to use our people, skills and technology, and to complement and expand our work on agriculture.

COVID-19

This year has continued to be challenging, and we are proud of all we have managed to achieve. All of our teams continue to work remotely, onboard new staff, and reach further to service our farmers and advance the frontiers of our research.

This quarter, our teams in India and Kenya completed a second round of surveys of smallholder farmers and agro-dealers (Kenya only) to improve our understanding of the evolving effects of the COVID-19 pandemic on households and small agricultural firms. New survey data was collected between mid-June and September 2020 in Kenya and two states in India.

Round 2 data have been incorporated into our [Dashboard](#). Across all three regions, a total of 4,166 farmers, of whom 1,070 (25.7%) were women farmers, were surveyed. In the fourth quarter, we

will initiate a third round of data collection in Kenya and one state in India.

The updated dashboard also includes a new set of visualizations to illustrate temporal trends over the course of the pandemic. Findings from Round 2 of the survey in Kenya are [written up on our blog](#), and were distributed as a [policy note](#) to stakeholders.

Conducting primary research in the context of a pandemic is challenging. In a piece published on the [International Growth Center's blog](#), PAD's India Research Manager, Hannah Timmis, and Senior Research Associate, Maya Woser, reflected on lessons learned through the implementation of PAD's multi-country survey to ensure that data collection in the midst of a pandemic is worth the time and effort.

New Funding to Support Rigorous Research

Two new grants will allow us to significantly invest in our research capabilities and expand the breadth and intensity of our activities:

MULTI-COUNTRY AND MULTI-INITIATIVE RESEARCH

In August, PAD received confirmation of the approval of a large grant to support our research. The grant - from an anonymous donor - will allow us to substantially expand our work to generate evidence.

The grant will be used to support research that builds a large body of evidence on the value of customized digital advice for smallholder farmers,

and to generate insights for the community of development practitioners active in this area. Projects will demonstrate proof of concept through small-scale testing; test hypotheses along PAD's theory of change; and explore new methodologies such as crowdsourcing and remote sensing. We plan to measure the impact of PAD's services on yields and/or profitability in two to three locations, and demonstrate the value of customized advice in three to four settings.

AN IMPACT EVALUATION OF OUR SERVICE IN ODISHA

The Bill & Melinda Gates Foundation (BMGF) will support the costs of a rigorous analysis of our *Ama Krushi* service in Odisha, India. The randomised evaluation of *Ama Krushi* will assess the impact

of PAD's mobile phone-based extension service in Odisha. By measuring the programme's effect on rice yields over multiple seasons, the RCT will provide crucial insights about the extent to which *Ama Krushi* is improving the lives and livelihoods of its one million end-users. The research design is highly ambitious. The team is exploring the feasibility of using remote-sensing, including satellite images and drones, to measure the output of up to 20,000 smallholders. The findings of this

Programmatic Updates

ETHIOPIA

Development of the Farmstack initiative continues. PAD has developed three initial use cases to provide information to dairy farmers and other users. Land O'Lakes and PAD signed an MoU for data sharing, and PAD will work to improve the artificial insemination (AI) service on both the demand side (advisory services for farmers that aim to increase their interest for AI service and can improve their capacity to detect heat) and supply side (improve the capacity of AI technicians). Improving farmers' understanding of the benefits of AI, and boosting demand for and access to AI, will play a central role in boosting milk production, and per cow milk productivity, in Ethiopia. Negotiations with the Agricultural Transformation Agency (ATA) to secure access to infrastructure to deploy these use cases are ongoing.

PAD Ethiopia is closely working with the ATA on its 8028 inbound Farmer's Hotline system, to improve and refine its services. In addition to the 21 crops for which agronomic content is available, ATA and PAD deployed livestock content in five different commodities: dairy, fattening (cows, sheep and goats), small-scale poultry, improved household poultry, and apiculture. The 8028 outbound service is back in operation following fruitful discussions between Ethio Telecom and ATA. However, capacity constraints persist, and PAD is in discussions with ATA to resume their jointly developed push call service in 2021. In this quarter, PAD surveyed 300

exploration are likely to have important implications for research in the agriculture sector, since yield measurement has historically suffered from high costs and inaccuracies. In addition, the research will incorporate sub-experiments or A/B tests into the treatment arm to generate rapid learnings on how digital information services can increase their impact. The results of the experiment are anticipated in 2023.

users of the 8028 farmers' hotline. Farmer feedback suggests that users increased their knowledge and adoption of improved technologies and crop protection strategies.

INDIA

In the third quarter our services in India surpassed the one million mark for farmers who receive advisory content in the country. PAD's Country Director, Niriksha Shetty, reflected on this remarkable milestone in a [post to our blog](#). A complementary video, including testimonials from farmers and extension workers, [is accessible here](#).

PAD India is in the process of incorporating PADDY, our in-house two-way messaging platform into all of our services. The TNC/HARIT team has successfully piloted the dissemination of outbound voice messages using PADDY. The PADDY platform has been successfully piloted in West Bengal (here's a short [video](#) of the demo of the IVR hotline!), with a full transition expected to complete in Q4. Once PADDY is fully functional, we will have access to more detailed user behavior data and it will be easier to run A/B tests. Moreover, the system will be more scalable and will be cheaper to operate.

The *Ama Krushi* service in Odisha secured approval from BMGF to support the extension of *Ama Krushi's* implementation horizon, and the transition of the service to government management, from March 2021 to September 2021. This funding will also support the addition of livestock and fisheries content to the service.



The Odisha team conducted an A/B test to assess if simple, targeted messages about the benefits of flood-tolerant rice seeds increase farmers' self-reported adoption and knowledge. Flood-tolerant seeds are evidenced to increase agricultural yields by around 50% in Odisha's lowland regions during moderate to severe flash flooding. The team is collecting the data in two waves to ensure efficient resource allocation. The first wave randomly selected 20% of the 10K study sample to survey. The survey evidence finds that 60% of farmers in lowland districts have experienced flood-related crop damage in the past three years, and over two-thirds are worried about flooding this season. In spite of this, fewer than 7% of farmers in the control group planted flood-tolerant seeds this year, perhaps because the state-run seed corporation does not yet supply these varieties widely. Preliminary analysis suggests that treated farmers were 2 to 3 percentage points more likely to adopt flood-tolerant seeds, and were also 6 to 7 percentage points more likely to understand the benefits of flood-tolerant seeds (this finding is statistically significant).

In a separate test to encourage inbound activity on the *Ama Krushi* service, we found that sending farmers a series of reminders and instructional messages about the service, significantly increased the likelihood of farmers to call in to the inbound service. However, the magnitude of this impact was relatively small.

KENYA

In September, PAD's MoA-INFO service commenced sending information to enrolled farmers ahead of the short rains planting season. A subset of the team - including an agronomist, a software developer, and researchers - [put together a fascinating blog post](#) capturing the confluence of workflows that powers PAD's work.

As documented in the team's [blog post](#), in Q3 MoA-INFO invited farmers to opt in to cropping series for the short rains season. A cropping

series consists of crop specific advisory content distributed to farmers at intervals timed to coincide with key decision-points in the season from pre-planting to post-harvest. At the close of the quarter, 42% of users had accepted invitations to topics within the cropping series. This is a slight drop from where we were in the first, long rains, cropping season of 2020. However, in absolute numbers, more users have opted into the platform for the season and the new subscriptions will lead to a substantial increase in the amount of information being sent to farmers.

This quarter, a great deal of groundwork was done to inform a gender survey of households engaged in dairy farming, to more effectively understand how household members engage in different aspects of dairy farming and to assess whether role assignment affects information frictions and trust within the household. This survey will shed light on some novel outcomes of interest for PAD including intra household decision-making, task allocation and time-use among household members, and financial choices. In Q4 we plan to survey approximately 600 farmers across three dairy cooperatives in the Rift Valley region and the Eastern region.

NIGERIA

In Q3 we officially hired our first staff in Nigeria. Country Launch Manager Uzoamaka Ugochukwu will oversee the development of our team and programmatic activities from Abuja. The team will fill out more in Q4. We are working with our partners to define the details of the intervention and to develop agriculture content. We expect to officially launch our initiative with IFAD and the Federal Government in Q4.

PAKISTAN

This was perhaps the most important quarter in the relatively short history of PAD Pakistan. Our team in Pakistan has grown threefold quarter on quarter. It is a time of great excitement, with a





great deal of activity and hard work, coping with challenges, laying the foundation of major projects, and growing our team in a context of social distancing. In Q3 the team in Pakistan engaged in a range of recruiting and preparatory work to support forthcoming implementation of projects with IFAD and HarvestPlus. Operationalizing this work will commence in earnest in Q4. We have also had to negotiate major restructuring and reform of the Agriculture Department Government of Punjab (AD GoP), all under the shadow of COVID-19.

The HarvestPlus initiative, which will commence in October, will raise awareness about the beneficial properties of two zinc biofortified wheat varieties, developed by the Government of Punjab, by sending customized SMS and Push Calls to farmers in selected districts of the province. A zinc deficient diet can weaken immune systems, trigger stunting in children and worsen maternal outcomes for women. Smallholders in Punjab use up to 60% of their wheat harvest for household consumption. Encouraging the adoption of zinc biofortified wheat may have a significant positive impact on household health among smallholder farmers. SMS and Push Calls will provide information to farmers in local languages (Urdu and Saraiki) about the health and economic benefits of zinc biofortified wheat seeds. As rising levels of carbon dioxide deplete crop nutrients and impact both food production and nutrient profile of staple crops, adopting biofortified crops is one protective measure that may be used to counteract these challenges. Biofortified crops

are rich in nutrients, vitamins and minerals needed for good health while at the same time having attractive agronomic properties to encourage farmer adoption such as higher yields or tolerance to major pests, diseases, temperature stress or drought. Adoption of such health-boosting, climate smart crops will lead to better health, increased yields and incomes for farmers in Punjab as well as environmental benefits such as reduction in the use of insecticides and pesticides.

PAD continues to provide technical assistance to the AD GoP to enhance the functionality of its new IVR system. Subsidy advisory services (supporting cotton, wheat and oilseeds farmers) which had previously been delivered using the Agriculture Delivery Unit (ADU) platform will be merged into the IVR platform moving forward. Once the IVR system is fully functional, it will become the primary mechanism for the Government of Punjab to deliver services to farmers in Punjab. The platform will also enhance our ability to monitor and measure the impact of service delivery. PAD Pakistan anticipates a steady increase in the number of users, and corresponding engagement rates, when the system is launched at scale in Punjab. As of the end of Q3, the IVR system has 26,000 users and the subsidy advisory services are reaching 1.1 million users.

PAD continues to engage with AD GoP to optimize Soil Health Cards formulation and delivery. Overfertilization of soil is a common problem in Pakistan as farmers lack information about the optimal use of fertilizers. Farmers are being

provided Soil Health Cards that contain customized information about the optimal use of fertilizers based on soil analysis of farmlands. Following SHC recommendations leads to reduction in input costs and farms that are more productive in the long run as well as preventing environmental damage from excess fertilizer usage such as nitrate leaching into groundwater. Over 7,000 improved SHCs were delivered between October 2019 and September 2020. A steady increase in the number of SHCs delivered is anticipated over the next year. PAD Pakistan is monitoring the activity which is being conducted by AD's field staff.

ZAMBIA

Following the conclusion of our inaugural project in Zambia, we have decided not to participate in another SMS campaign for the 2020-21 season (November 2020-April 2021). The project disseminated Fall Armyworm advisory and pest-management content to 80,000 farmers utilizing the government of Zambia's ZIAMIS platform.

CABI is planning to work with the Zambian Ministry of Agriculture (MoA) and Smart Zambia to send the same set of FAW advisory messages to farmers in the forthcoming season. PAD will remain copied on all discussions between CABI and the MoA. This decision was informed, *inter alia*, by the following considerations: our inability to travel to Zambia, due to COVID-19, which limited our ability to build relationships in the MoA and Smart Zambia. Our primary contact person in Zambia will be on leave for a number of months. This individual was

instrumental in coordinating activities with the MoA and Smart Zambia. We anticipate that it will be very difficult to oversee implementation of the campaign from Kenya.

In Q3 we completed a phone survey of a sample of 3,000 farmers enrolled in the Fall Armyworm campaign. We contracted IPA to conduct the survey and are working on analysing the data. We expect to have results to share in Q4.

PRECISION DEVELOPMENT EDUCATION PILOT (KENYA)

In Q3 Precision Development (PxD), in partnership with Young 1ove, IPA, and the Kenya Institute for Curriculum Development (KICD), conducted its first non-agriculture related work: a pilot of an education service in Kenya. The pilot focused on supporting math skills for primary school-aged children affected by Kenya's school closures.

Sending math skills learning materials via SMS to simple (not-smart) phones may help limit learning loss and drop-out rates associated with COVID-19-related school closures. We are particularly interested in catering to children in lower income households, girls who are at higher risk of dropping out due to school closures, and households living in geographically remote locations. The two-week pilot sent trial math exercises to children to assess their skill level and, thereafter, sent them math exercises pitched to their abilities. As children master exercises of a certain difficulty, we send them more challenging exercises. Conversely, if a



child is struggling with their current set of exercises, we send them easier exercises. The pilot, had the following results:

Users invited (including 9 PAD staff)	109
Users accepted	58
Users who completed an assessment	47
Users who completed a set of exercises	37
Total sets of exercises complete	350
Users who completed phone survey to collect feedback	59

The pilot will inform the development and delivery of a free two-way SMS service in Kenya called *ElimuLeo* (Education Today). *ElimuLeo* will commence with four mathematics topics (addition, subtraction, multiplication, division), and

Organizational Updates

In Ethiopia we are excited to announce new promotions and leadership: Habtamu Yesigat has been promoted to Director of Programs, Ethiopia. Habtamu will also be responsible for overseeing research on the Ethiopia team. Kalkidan Arega has been promoted to Senior Project Manager and Acting Director Partnerships and Operations, Ethiopia. Kalkidan and Habtamu will jointly lead our work in Ethiopia moving forward and join PAD's leadership group.

In Nigeria, our team is now led by Country Launch Manager Uzoamaka Ugochukwe, who has also joined PAD's leadership group. Uzoamaka is based in Abuja. She holds a Masters of Arts in Global Human Development from Georgetown University. Before joining PAD, she was a Senior Supervisor at the Central Bank of Nigeria.

We are very pleased to announce that Maya Woser and Ashish Kamra were promoted to Senior Research and Operations Associates (India), and

will add other mathematics topics, and eventually other subjects as it develops. At the beginning of the service, we will assess the skill level of each student and then send them exercises pitched at their level. If a child is able to answer at least 80% of the exercises correctly, we will send them harder exercises (corresponding with an advance of one term in the national curriculum). If they answer 20% or fewer of the exercises correctly, we will send them easier exercises (corresponding with a step backward by one term in the national curriculum). A simulation of mathematics exercises [is available here](#). For each topic, we will track the student's level separately, so for example, if a student can complete subtraction associated with the Class 5 level, we will assess their multiplication skill separately instead of assuming that they are at Class 5 level across all subjects. Exercises will be pushed to students at regular intervals to maximize engagement with the service. PxD will launch *ElimuLeo* in Q4 with a target of reaching 20,000 users by the end of January.

Kara Czczotka became Senior Associate, New Program Development (Global).

In Q3 we welcomed the following new staff to our team: Farheen Sayam (Senior Research Associate, Pakistan), Kailash Pandey (Part time RA), Uzoamaka Ugochukwu (Nigeria Country Launch Manager); Georges Poquillon (Senior Research and Operations Manager, Kenya), Eric Li (Product Intern, Global), Sylvester Ogutu (Senior Research and Operations Manager, Kenya), Syed Muhammad Shams Sadiq (Research Associate, Pakistan), Ahmad Ayu (Research Associate, Pakistan), Taimur Farooq (Project Manager: New Programs, Pakistan), Shradha Parashari (Research and Operations Associate, India); Pranav Singh (Research and Operations Manager, India)

We bid *adieu* to the following staff, and wish them well: Anu Kumari (Agronomist, India) and Kaitlyn Turner (East Africa Research Manager).

FINANCIALS

- Total operating costs for the twelve months to 30 September 2020: \$4.6M
- Total funds available cover approximately 9 months of operations.

FUNDER UPDATES

- BMGF (via Digital Green) - extension funding to support implementation of Farmstack (detailed in the main body of the report)
- Anonymous grant - to support research activities (detailed in the main body of the report)
- BMGF grant - support for Odisha evaluation, and Odisha extension (adding livestock and fisheries, transition of *Ama Krushi* Service to Government)
- Douglas B. Marshall, Jr. Family Foundation - seed grant to begin piloting digital education services in Kenya
- A new grant from the Instiglio COVID-19 adaptation fund - COVID-19 related activities in Kenya
- The International Food Policy Research Institute (IFPRI) - supporting our work with their subsidiary, HarvestPlus in Pakistan (see detail of project in main body of report)
- BSZ/Alfred Landecker Foundation - support for the RCT we are running with Uganda Coffee Agronomy Training Program (UCAT)



The small reduction in farmer reach from Q2 to Q3 is driven largely by responses of our partners to the COVID-19 pandemic, including decisions by some partners to reprioritize activities in 2020. In addition, we are currently in the process of systematically revisiting our methodology for measuring farmer reach to more accurately reflect the impact of our work. A key component of our work is to partner with governments, non-profits, private businesses, and other partners to build new digital services and to improve existing services. In these contexts, our intention is often to transfer management of these services eventually to our partners, after which our direct involvement ends. Our current methodology for measuring farmer reach does not consider the success of these types of partnerships, and only accounts for one particular type of growth (direct long-term service provision) over others (such as build-operate-transfer), which may not maximize long-term impact.