Quarterly Progress Report - Q1 2021

PxD
PRECISION DEVELOPMENT

Precision Development Branding

As detailed in our Q3 2020 Progress Report, in August of last year the Board of Precision Agriculture for Development authorized the organization to consider opportunities to provide information services in education and other sectors. The provision of customized digital information to boost agricultural productivity and smallholder incomes is our core activity and will remain so. In September we formally changed our legal name to Precision Development (we will use the acronym PxD) to accommodate a wider range of possible activities. This report is presented in alignment with PxD's new color palette and logo. We hope you approve our new sartorial disposition.

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India

Ama Krushi

Our *Ama Krushi* service which we deliver as part of a build, operate and transfer agreement with the Government of Odisha, with support from the Bill & Melinda Gates Foundation and UK development aid, continues to scale. An additional 100,000 new farmers were profiled and added to the platform in Q1. Of these new farmers, more than 30,000 are livestock farmers who have joined as a consequence of our partnership with the Odisha government's Department of Fisheries and Animal Resources Development (FARD). *Ama Krushi*'s total farmer reach for Q1 was 1,132,966.

Ama Krushi is now operational on Paddy, PxD's in-house tech platform. Paddy was initially developed to run our two-way SMS service, MoA-INFO, in Kenya. Our Nigeria and Colombia platforms are being explicitly developed to run on Paddy, and we are progressively integrating our India initiatives onto the platform. Running one system across a plurality of our services will offer a series of advantages in terms of efficiency, cost-savings and opportunities for learning. Using our own platform, which was designed to accommodate and facilitate A/B testing, also allows for greater ease of experimentation and more rapid implementation of new features. A particular advantage with respect to *Ama Krushi* is Paddy's capacity for automating tasks. We expect this will free up significant capacity for our agronomy team to focus more intensively on tasks and programming aligned with their expertise.

The team recently tested two new approaches to train farmers on the *Ama Krushi* inbound service ("hotline"). The first approach provided remote training directly to farmers via PxD surveyors. The second form of training, provided incentives to farmers who had previously used the service to train their peers. The latter was tested in the form of a small pilot. We have found suggestive evidence that providing incentives to farmers to train their peers is more cost-effective than providing training directly to farmers. Under the first approach, we contacted 4,502 farmers and received 100 questions (ratio ≈ 100:2); under the second, we contacted just 43 farmers and received 24 questions from peers they had trained (ratio≈ 100:56). The results of the pilot also suggest that providing encouragement without incentives may not be effective in motivating farmers to provide training to their peers.

Krishi Tarang

Krishi Tarang, our two-way digital advisory service in Gujarat, is our oldest continuously delivered service in India and plays a key role as a platform for exploring proof-of-concept for product innovation, the piloting of new service design and delivery features, and for exploring collaboration with private sector organizations. Building on evidence from external literature and PxD surveys that many farmers turn to agro-dealers for agricultural advice, we are also working on developing and piloting a version of *Krishi Tarang* designed to serve agro-dealers themselves. Our goal is to design a product that

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improves the quality of the advice that agro-dealers provide, and also generates value for the agro-dealers themselves (possibly through certificates or other forms of recognition that they are partners of *Krishi Tarang*). We are progressively adding and profiling new farmers recruited via outreach to farmer producer organizations (FPOs) and have signed an MoU with an organization called GujPro to invite approximately 50k new users to the service. We anticipate these new farmers will be added to the service in the next six to nine months.

Coffee Krishi Taranga

Our *Coffee Krishi Taranga* service which we deliver in partnership with the Coffee Board of India continues to profile and add new coffee farmers from the expansion states of Kerala and Tamil Nadu as well as in Karnataka where we have operated since July 2018. In Q1 the service added 4,422 new farmers, equivalent to quarter-on-quarter growth of 9 percent, and surpassed 55,000 farmers enrolled in the coffee digital extension program in the process. As detailed in the 'Funder Updates' section below, our collaboration with the Coffee Board of India recently received a significant boost in the form of a new grant from the Walmart Foundation.

Pakistan

In collaboration with IFAD, in Q1 PxD Pakistan reached approximately 1.15 million smallholder farmers with advisory to promote agricultural productivity and protect livelihoods via the voice and SMS-based extension platform that we designed on behalf of the Agriculture Department of the Government of Punjab (AD GoP). In doing so, we have already surpassed the target of 1.1 million farmers for the Pakistan component of the

grant. We are in discussions with IFAD to expand these services to additional beneficiaries of the Southern Punjab Poverty Alleviation Project and other IFAD-funded projects and partners, with a particular focus on reaching women and livestock farmers.

The PxD Pakistan team has commenced a livestock related advisory initiative to improve access to information about optimal livestock management techniques, with an initial user target of around 3,600 female beneficiaries. We are engaging with IFAD and other partners to add additional user details to the service. By 2022 our ambition is to reach 30,000 users with livestock related advisory.

Our collaboration with HarvestPlus to promote the benefits of zinc biofortified wheat to smallholder farmers in Punjab surpassed the target of 100,000 farmers in the pilot phase of the project. The team is currently concluding a survey to assess perceptions of the service, and reported impacts on knowledge, adoption and yield. The team is excited to engage with HarvestPlus to explore interest in scaling up the project in future seasons.

Ethiopia

In Ethiopia intermittent restrictions on internet access, irregular power, complications arising from the COVID-19 pandemic and ongoing political instability have contributed to a difficult working environment. The Ethiopian Agricultural Transforma-

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tion Agency's (ATA) 8028 farmer's hotline, which PxD Ethiopia has been retained to develop content for farmers, and to improve user experience and service delivery, was inactive in January and February.

In Q1, despite this challenging environment, PxD Ethiopia made significant progress in content development to elaborate the dairy use cases for the Digital Agricultural Advisory Services (DAAS). PxD is leading the development of dairy use cases for the DAAS, as part of a consortium led by Digital Green and in partnership with the Ethiopian Ministry of Agriculture and ATA. DAAS aims to reach 3.5 million farmers in five years. Integrating human-centered design (HCD) practices, in Q1 the team developed content for training Artificial Insemination (AI) technicians to more effectively provide AI services, and developed farmer focussed content on the importance of the AI service, heat identification, and calf and cow management. This advisory content was evaluated and validated by the Technical Advisory Committee composed of representatives of the Ministry of Agriculture, ATA, and other stakeholders. DAAS's dairy content will be launched on the 8028 hotline in Q2.

Kenya

MoA-INFO

PxD Kenya's MoA-INFO team ran an extremely successful Safaricom campaign in Q1 to acquire new users. The campaign increased the number of MoA-INFO users by at least 105,000. An additional 89,000 new users were added to the service from two IFAD-financed projects (the Upper Tana Natural Resource Management Project (UTaNRMP) and the Kenya Cereal Enhancement Programme Climate Resilient Agricultural

Livelihoods (KCEP-CRAL)) as part of our broader collaboration with IFAD.

In Q1, we added new cabbage advisory content to the MoA-INFO service, bringing the total number of cropping series on the platform to eleven. The team has also worked to integrate HCD principles into the design of priority cropping series messages and completed evaluations of two new decision-support tools for composting and maize seed selection (Seed Selector Tool - SST).

Ahead of the long rains planting season - the primary growing season in Kenya - which will commence in Q2, the MoA-INFO team has planned a series of nine A/B tests to, inter alia, test:
The effectiveness of a redesigned registration process. Comparison will be made between a sample of new platform users who will receive the normal registration process (name ▯ location ▯ cropping series opt-ins) and a second group who will receive a redesigned registration process (cropping series opt-ins ▯ name ▯ location).
The effectiveness of gain versus loss-framed messages in cropping series opt-in invitations.
The effectiveness of having an initial introduction call on platform engagement and subsequent behavior (cropping series opt-ins, menu access, awareness/knowledge about agronomic content and practice adoption). Treatment group users will receive a welcome message to the MoA-INFO, and an overview of MoA-INFO and its key functionalities either via IVR or enumerator calls, while control group users will not receive any introduction call.

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Whether adding an expert recommendation will increase farmers' likelihood of browsing high-yielding locally suitable seeds on the SST, and whether this translates into changes in seed adoption.

COVID Survey

In Q1, the team completed analysis of a third round of interviews (funded by the Instiglio COVID-19 Adaptation Fund) with 509 crop farmers and 274 agro-dealers registered on the MoA-INFO platform in Kenya. This survey was the third and final round of a panel survey, of which the first round took place between late April and early June 2020, and the second took place from August to early September 2020. The first two rounds of surveys focused on the long rainy season, which is the main agricultural season in Kenya, and the third round examined the short rainy season. Data from all three survey rounds are visualized on our COVID-19 Dashboards.

One Acre Fund (OAF)

PxD Kenya collaborated with OAF on two trials in Q1: the "Early Bird Discount Bundle Trial", to investigate whether a small time-limited discount offered through SMS messages increases adoption of recommended inputs, and the "Planting Date SMS trial", to investigate whether sending recommendations to farmers about the most optimal time to plant, generated by a satellite-data based model, influences planting dates. We expect to have results for these two experiments in Q3.

ElimuLleo

The ElimuLeo team added new topics to the education service: in addition to subtraction, addition, multiplication and division, we have now added mixed exercises (e.g. an addition problem, then a division problem, then a subtraction problem), combined exercises (i.e. multiple operations in a problem, like 3 * 8 - 15) and algebra.

The team recruited new users at the end of March for a planned RCT designed to compare students who had access to the service and received nudges to encourage interaction with the service with a control group who had access to the platform but did not receive nudges and encouragement to use it once they had completed the initial assessment to determine if the service has an effect on numeracy. While our first recruitment campaign elicited an opt-in rate of 43 percent, the most recent campaign elicited an opt-in rate of 38 percent. However, these users added in the second round of recruitment have been more active than those added in December. We surmise that this is likely a consequence of being able to activate them on the service within 48 hours, compared to December when logistical challenges contributed to a lag of two weeks between the acceptance of an invitation and activation. Active users in the period spanning January to March completed an average of 16.7 exercises per user, which masks significant variation. Activity on the platform increased significantly at the end of the quarter when school holidays commenced. We expect to report much higher engagement in Q2.

Nigeria

PxD Nigeria launched its maiden agronomic advisory campaign on our new service in January 2021. By the end of Q1 the team had completed broadcasting dry season programming to a cohort of 5,613 smallholder farmers to support the cultivation of five priority crops.

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The team has developed a strong working relationship with the Federal Ministry of Agriculture and the IFAD project team overseeing the Climate Change Adaptation and Agribusiness Support Programme (CASP). Access to CASP farmer details has contributed to the acquisition of unique phone numbers of 39,000 (excluding invalid farmers' data) smallholder farmers ahead of the second advisory campaign planned for the wet season, northern Nigeria's primary growing season. At the end of Q1 39,000 farmer phone numbers received from CASP had been validated and will be added to the service for the wet season which commences in early June.

On March 22nd, the team launched a feedback survey targeting a sub-sample of randomly selected users who had received content during the dry season campaign to assess users' satisfaction with the dry season message service and to identify factors that influence farmer engagement. The targeted sample was randomly drawn from two categories of farmers across the seven targeted states: farmers from a high participation group (with more than 50% average listening rate) and farmers from a low participation group (with less than 50% average listening rate). 746 surveys were successfully completed (528 from the high participation group and 218 from the low participation group). Seventy-one percent of farmers surveyed reported receiving the advisory content. Of these farmers, 94 percent reported that the messages were understandable, and 92 percent reported that the recommendations were actionable. Farmers cited fertilizer management and application, followed by use of improved seeds variety as the most useful topics. 99 percent of farmers who confirmed receiving advisory reported that they would like to continue receiving the digital service; only 26 percent of farmers reported access to any other form of extension service.

Colombia

In Q1 the Latin America team accrued its first fully dedicated employees. As of 10 May, the nascent team included three full time staff and a PxD tech engineer seconded from the technology practice. In Q1 PxD signed a contract with Rare and commenced preparatory activities to implement the 'Adopting New Technology, Mindsets, and Practices to Transform Colombia's Agriculture Sector' project. We signed an agreement with an aggregator, Sinch, and commenced building the project's technology platform. Due to unanticipated delays in finalizing the overarching contract, we now anticipate the service will commence in June, not May as originally planned.

We continue to pursue a range of additional development leads in collaboration with our regional partner, the Inter-American Institute for Cooperation on Agriculture (IICA).

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Organizational Updates

Organizational Updates:

At the end of 2020, Precision Agriculture for Development co-founder and member of our board Dan Bjorkegren tendered his resignation from the board. Dan's vision and ambition were critical to PAD's inception and central to the organization's development and growth trajectory. We thank Dan for his creativity, foresight and service.

We welcomed the following new hires to our teams in Q1:

Dat Tan Huynh, Software Engineer, PxD Global; Niek de Greef, Web and Design Manager, PxD Global; Sajwaar Khalid, Research Associate, PxD Pakistan; Shruti Sahu, Agronomist, Odisha, PxD India; Resmarani Mohanty, Fisheries Expert, Odisha, PxD India; Aparna Priyadarshi, Research and Operations Manager, PxD India; Laura Chaves, Research and Operations Associate, PxD Colombia; Sarah Kariuki, Post-Doctoral Researcher, PxD Global; Erika Caballero, Colombia Country Launch Manager, PxD Colombia.

We are pleased to announce that the following colleagues have been promoted:

Vineet Keshaw, Process and Product Innovation Manager, Odisha, PxD India; Daniel Mokrauer-Madden, Project Manager, PxD Kenya; Yifan Powers, Global Research and Operations Manager, PxD Global; Theresa Solenski, Global Monitoring and Product Analysis Specialist, PxD Global.

IFAD Innovation Talk

Since August 2020, PxD has collaborated with the International Fund for Agricultural Development (IFAD), a UN affiliated multilateral agency, to deliver digital advisory to assist smallholder farmers in Kenya, Nigeria and Pakistan to boost productivity and resiliency as they navigate the evolving impacts of the COVID-19 pandemic.

On 05 May 2021, IFAD convened an #IFADinnovationtalk webinar to showcase our partnership under the auspices of presentations and a panel discussion entitled 'Digital Agriculture and the Rural Poor: Challenges and opportunities in delivering results'. A recording of the event, including keynote speeches by Michael Kremer, PxD co-founder and Nobel Prize winner, and Owen Barder, PxD CEO, and a panel discussion featuring Uzoamaka Ugochukwu, PxD Nigeria Country Launch Manager in discussion with colleagues from IFAD and partners is accessible on our blog.

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Funder News

Walmart Foundation

In April 2021, PxD received a generous grant of $1.5 million from the Walmart Foundation to expand our work with smallholder farmers in India. This grant will support our work scaling up low-cost digital extension in partnership with the Coffee Board of India (CBI) to 150,000 farmers, with a particular focus on female farmers. It will also help us expand geographically from Karnataka to an additional coffee-producing state - Andhra Pradesh - and diversify our services to both coffee and spice cultivation, in line with a more holistic "whole farm system" approach. This initiative will provide a proof of concept for a bundled model combining digital agricultural advisory services with the development of improved market linkages and farmer aggregation structures to improve farmers' incomes and access to output markets. Our advisory services will encourage adoption of environmentally sustainable farming practices - including agroforestry and water and soil improvement. The initiative will also promote various types of farmer aggregation structures and link these with commitments from buyers wishing to source sustainably grown coffee and spices. These market linkages are intended to serve as an incentive to farmers to adopt more sustainable practices or diversify their output to specialty varieties. For the market linkages component of this initiative, PxD will partner with IDH, the Sustainable Trade Initiative, to pilot various approaches to help farmers capture higher prices and enter newer markets, connect farmers with

buyers, identify potential aggregation structures for coffee growers, build capacity with these aggregation structures, and establish credible verification protocols to determine if farmer groups are following sustainable practices.

Financials

Q1 Budget: $1.8M.

Unaudited actual expenses $1.5M

Current cash on hand (programmatic and unrestricted) for 2021 is $3.5M, equivalent to 51% of current 2021 budget

Outstanding commitments for 2021 are $2.9M, leaving a $0.5M minimum gap for the current year (excluding product development, scaling and organizational development activities we would ideally complete this year if we can find funding to support activities).

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Funder Updates

We are very grateful for the following new commitment received in Q1:

GiveWell made an unrestricted grant of $100,000

Cumulative user reach Q1: 4 998 594
Current: 4 125 119
Legacy: 873 475

Average annual cost per current user reached: $1.49
(excluding legacy users)

In many settings we work to improve the services of others and operate services that we build and operate with the intention of transferring their legacy management and operation to partners. As a consequence we have begun to collect information about our legacy user reach. We define legacy user reach as "the number of unique farmers receiving services developed, enhanced, or improved by PxD and managed by partners without our direct involvement through legacy programs in the last 12 months". We do not directly interact with legacy users but they continue to benefit from our work. We measure legacy reach by asking our partners if they continue to implement programs PxD was involved in designing, optimizing or delivering, and how many users they are reaching with those programs. As we continue to use the Build Operate Transfer Model, we expect legacy reach to continue to grow and become a substantial, important part of our farmer reach.

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