Precision Development (PxD)
Four Year Strategy (2022-25)

Table of Contents

Executive Summary

Vision, Mission, and Values
  Vision
  Mission
  Values

Our Approach

Impact Strategy
  Developing High-Value Services
  Increasing User Engagement and Adoption

Scaling Strategy

Implementing the Strategy
  Innovation Lab
  Target Geographies
  Partnerships and Scale
  Organizational Development
  Scale and Budget Projections

Appendices
  Evidence of Impact
  Diversity, Equity, and Inclusion
  Governance

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1 This document is a medium-term strategy that lays out PxD’s high-level priorities for 2022-2025. It does not seek to predict where we expect PxD to be in the longer term (i.e. 5-10 years from now), nor does it include or rule out all possible directions of PxD’s future evolution. It does not include the full scope of PxD’s short-term activities and priorities, which are covered in much more detail in the annual Objectives and Key Results (OKRs) that have been created for 2022 and will be created in each subsequent year.
Executive Summary

Precision Development (PxD) is a global development non-profit with a vision to end information poverty, a mission to provide actionable information and other cost-effective, scalable services to people in poverty so they can sustainably improve their incomes and well-being, and a long-term goal of providing these services to 100 million people. Key elements of our approach include rigorous research to understand our users and design services based on existing evidence; human centered design and lean product development from the tech sector to develop products that solve users’ problems; simple, low-cost technology to serve very poor users; partnerships to jointly build and scale our services; teams empowered by localized decision-making, transparency, and accountability; and programs financed by implementing partners, bilateral and multilateral donors, philanthropic foundations, and research funders.

Our primary intervention is Digital Agricultural Advisory Services (DAAS), in which we provide information and advice to smallholder farmers via mobile phones to increase their incomes, productivity, and environmental sustainability. There is a growing body of evidence that these services have a positive impact on user knowledge, adoption, and welfare, that these services reach extremely poor smallholder farmers, and are likely to be highly cost-effective with a high return on investment.

In the near-term our Impact Strategy is focused on increasing impact per user of our services, which includes both developing high-value services that deliver as much positive impact as possible for the people that use them and adopt them, and increasing user engagement with these services so they can deliver positive impact to as many people as possible. Developing high-value services will include investments in several complementary areas. We will increase the value of our core Digital Agricultural Advisory Services by investing in more rigorous systems for developing these services in each unique setting and customizing them to each user’s needs. We are developing new high-value services in agriculture that complement our core agriculture services, such as high-resolution weather forecasts, real-time information on pests and diseases, access to loans to purchase productive assets, new technologies to enable smallholder farmers to adapt to and mitigate climate change, and improved linkages to agricultural markets. And we will develop high-value services in other sectors such as nutrition, financial access, and education that deliver positive impact to new populations of users. Similarly, increasing user engagement will include several complementary areas, including improving the user experience of our services, increasing the persuasiveness of our recommendations, increasing the customization of our advice, and improving user targeting to
focus on people who are likely to adopt our recommendations. We intend to operationalize this impact strategy by establishing an Innovation Lab to help us identify and prioritize the most promising opportunities to deliver long-term, sustainable impact.

Our long-term goal is to achieve impact at massive scale. At the same time that we invest in increasing our impact per user, we will simultaneously scale our impact through a Scaling Strategy with the following themes. First, we achieve cost-effectiveness at scale by investing substantially in fixed costs such as R&D, only launching services that are likely to scale to very large numbers of users, and designing services that have near zero marginal costs. Second, we believe that investments in R&D to increase our impact per user will fuel growth in scale in future years by driving demand from both partners and users. Third, we aim for a funding mix in which large-scale service delivery is sustainably funded by public authorities, long-term institutional funders, or private sector partners, and R&D and organizational development will continue to be provided through philanthropic donors, individual supporters, and research funding organizations. Fourth, we grow through large-scale partnerships with governments, non-profits, and private businesses who provide complementary services to large numbers of users, including in some cases partnerships that will sustain our services even after PxD’s direct involvement. Fifth, we drive impact through the central role of research and evidence throughout our work, and we generate and share evidence with the broader research, policy, and service delivery community to accelerate impact at scale. Lastly, we deploy a variety of models for service delivery at scale, including Build-Operate-Transfer in which we build a service and transition it to a partner, Build-Operate in which we build a service and operate it in the long term, and Partner Advisory in which we advise partners to improve existing services.

To implement this strategy, we intend to primarily grow internally in PxD’s existing geographies, which have significant room for expansion, with a focus on South Asia and sub-Saharan Africa where the majority of the world’s very poor people live. We plan to continue to develop partnerships with governments, non-profits, private businesses, agricultural scientists and research institutions, as well as researchers in behavioral science, economics, and empirical methods to design, operate, and evaluate high quality services. We plan to make key investments in PxD’s organizational development to improve our organization’s capacity and ensure that it grows in lockstep with our programmatic growth and development. Over the four years of this strategy (2022-2025) we have the capacity to realistically grow from 5.7 million users in 2021 to 20 million users in 2025 under a high growth scenario (if funding allows). This rapid growth will require a total budget of $77.9 million over these four years to cover costs for organizational development, service delivery, and the Innovation Lab to grow our impact.
Vision, Mission, and Values

As an organization in its first decade of existence, we have done substantial rethinking and honing of our organizational vision, mission, and approach over the past few years. Below, we explain the vision, mission and values of the organization:

Vision

An end to information poverty.

Mission

Provide actionable information and other cost-effective, scalable services to people in poverty so that they can sustainably improve their incomes and well-being.

Values

1. We are passionate about positive and sustainable impact for the most disadvantaged people.
2. We respect and empower the people we serve.
3. We value diversity, equity and inclusion in our team, and are committed to matching our values with action.
4. We are humble & curious. There is always more to learn, and we trust evidence.
5. We act with integrity. We are transparent, honest and accountable.

Our Approach

PxD specializes in developing, iterating, and scaling interventions that deliver information, advice, and other services to smallholder farmers and other people living in poverty to enable them to improve their well-being, with very low cost per additional user. Key elements of our approach that differentiate us from other organizations include:
• **Research:** To ensure our products deliver impact, we invest heavily in R&D, including understanding our users and the constraints they face, conducting highly rigorous research on complex questions, designing our services based on existing evidence from the agricultural economics and development economics fields, running experiments to iterate and evaluate our services, partnering with leading external researchers, and sharing our findings with the global research community.

• **Product:** We focus on the user to design services that are engaging, easy to use, and help our users solve important problems in their lives. We embed our product teams within each country context and use human centered design, A/B testing, and engagement and adoption data to drive continuous product improvement. We combine our R&D capacity with lean product development approaches from the tech sector to understand our users in each context, diagnose user problems, collect rapid user feedback, and develop and iterate products that deliver the greatest possible impact.

• **Technology:** We focus primarily on serving very poor users through low-tech, low-cost, digital information services that can be customized and delivered at very large scale and near-zero marginal cost per user. These services are designed to effectively serve the poorest users on basic mobile phones, which represent an under-served segment of the market and the majority of our user base. We have also begun to build for the future by developing services for smartphone users, which represent a small proportion of our current users but will become increasingly important as smartphone penetration increases over time; these services have the potential to provide more sophisticated information content, help us better customize and target our services, generate positive spillover effects for basic phone users, and ultimately migrate existing users onto improved services in the future. We have built a technology platform that leverages the growing volume of data available from internal and external sources and combines these disparate data sources into customized, actionable information that is available to users on any type of hardware, through any telecom network, and in any setting. However, our goal is to build the overall market for digital information services, not our own market share; we seek to catalyze a pluralistic ecosystem of technologies built by PxD and others that are universally accessible for sustainable service delivery at scale, rather than exclusively promoting our own proprietary technology platform.

• **Partnerships:** We use partnerships to scale, building relationships with governments, institutional funders, private sector partners, and other NGOs to jointly build and scale our services for the users that need them, keeping user acquisition costs low and keeping our services free to the user.
• **Team:** Our teams are empowered by a system of localized decision-making, with each country office designing programs with local knowledge that match the needs of users in each context. This localized decision-making system is supported by explicit, clear delegation of authority for each decision, a quick, transparent, and evidence-based assessment of ideas and approaches, shared responsibility for leveraging the expertise across PxD's different teams to make evidence-based, data-driven decisions, and transparent monitoring and accountability of the impact we are having. We aim to invest in the ongoing growth and learning of each staff member, with decision-making driven by cross-functional country teams while organization-wide professional groups provide support and training in areas of technical expertise. We value diversity, equity, inclusion, and belonging, and give priority to ensuring these are integrated throughout our work.

• **Finance:** Our program delivery and operating expenses are covered by programmatic funding from implementing partners (governments, businesses, and NGOs), bilaterals and multilaterals, and a few large foundations. We fund innovation, research & development, and organizational capacity development through philanthropic and research funding.

### Impact Strategy

In our first six years (2016-2021), PxD has successfully demonstrated the key components of our core theory of change, including that we can build and deliver digital information services, that users engage with these services, that there is rigorous evidence that engagement with these services has a positive impact on user knowledge, adoption, and welfare, that these services are likely to be highly cost-effective with a high private and social return on investment, and that we can rapidly scale these digital services to millions of people. A summary of the rigorous evidence of the impact of PxD’s services is found in the Appendix on Evidence of Impact.

Our near-term priorities are focused on **increasing impact per user** - building compelling high-value services that have a clear value proposition for users, high levels of engagement, and evidence of impactful outcomes. As we improve our services, we expect engagement to increase, user benefits to increase, cost-effectiveness to improve, and demand to increase. As we invest in increasing our impact per user in the next few years, we expect that this will enable rapid demand-led growth in both scale and aggregate impact in future years.
Our primary intervention today is providing Digital Agricultural Advisory Services (DAAS), whereby we provide profit-improving information and advice to smallholder farmers via their mobile phones, in formats that are easy for them to use and implement. These digital agricultural advisory services help to improve farmers’ lives by addressing the complex, inter-related challenges of rural poverty, food security, and climate change. We aim to increase farmers’ risk-adjusted net incomes to reduce poverty and improve standards of living; increase farmers’ crop and livestock yields to improve food security; and increase farmers’ ability to adapt to and mitigate climate change making agriculture more environmentally sustainable in the long run. Even as we grow in a variety of ways, we anticipate retaining these services as a centerpiece of our impact strategy for the next four years.

In both our core services and new services that we develop, we expect that increasing our impact per user will require sustained investments in:

1. Developing high-value services that deliver as much positive impact as possible for the people that use them and adopt them; and
2. Increasing user engagement with these services so they can deliver positive impact to as many people as possible.

Building on our prior work in these areas, we believe we have a viable path to substantial increases in both of these areas, and intend to devote substantial resources in the coming years into both areas. We believe that these investments are likely to pay off rapidly in increasing our impact at scale.

Developing High-Value Services

Developing high-value services includes investments in the following areas: increasing the value of our core agriculture services by investing in more rigorous systems for developing these services in each unique setting; developing new high-value services in agriculture that complement our core agriculture services; and developing high-value services in other sectors that deliver positive impact to new populations of users.

Increasing the value of our core agriculture services

PxD’s core digital agricultural advisory services are predicated on a few key facts: according to the Food and Agriculture Organization (FAO), smallholder farmers in low- and middle-income countries typically harvest only 30-50% of what their land could produce (FAOSTAT); farmers are
often not maximizing their risk-adjusted net incomes; climate change presents significant challenges to farmers and they have limited tools to adapt to the current damage caused by climate change or to help mitigate further damage; there are many agricultural practices, inputs, and technologies available that could improve farmers’ yields, incomes, and environmental sustainability; and adoption of these practices, inputs, and technologies remains low, in some cases due to farmers’ lack of knowledge.

We believe that there is substantial additional value to be created for farmers through greater investment in identifying **high-impact, evidence-based agricultural recommendations** for them to follow. Because evidence for recommendations in agriculture often needs to be developed specifically for a particular crop or livestock value chain in a particular geography, and needs to account for additional concerns such as affordability and appropriateness for a smallholder to adopt, the process of developing evidence-based agricultural advice is often complex. We expect to focus in the next few years on strengthening our systems for agronomic content development, pairing our internal expertise in agronomy and research with external expertise at agronomic research institutions and other partners. This will allow us to identify the most valuable recommendations for each setting where we operate a service, and to give priority to those services with the greatest impact and cost effectiveness.

We believe that further **customization of agricultural recommendations** is also likely to increase the impact of these recommendations for each user who adopts them, including through greater application of data science and AI/machine learning, and that the returns to these investments will increase as we make some of the other investments highlighted here. We are exploring this in pilot settings, including through partnerships with leading academic institutions that work on AI, with the expectation that we will likely expand this work in future years.

**Developing new high-value services in agriculture**

The reasons for farmers’ yield gaps are complex and are not always due to lack of knowledge. Farmers’ yields may also be limited by other factors: farmers may face behavioral constraints which may limit their adoption of optimal practices in the long-term; farmers may be maximizing something other than yield, such as risk-adjusted income; farmers may lack critical real-time information (e.g. weather, pests, prices, input availability) which prevent them from increasing yields as much as they could; extremely poor farmers may not have social safety nets, insurance, or savings to mitigate risk, leading to under-investment in inputs that may have downside risk in bad years; and farmers may face coordination and market failures, such as lack
of access to credit, high input prices, or lack of output markets. A key part of increasing our impact is investing in a thorough and granular understanding of the constraints that farmers face in each setting.

While digital agricultural advisory services are likely to remain one of our main offerings, we are also exploring a variety of new, evidence-based high-value product innovations for people living in low- and middle-income countries that can be delivered at very low cost per additional farmer and can supplement our core Digital Agricultural Advisory Services, either as additions to current services, or as standalone offerings. These include services that can build on our agricultural impact for smallholder farmers, such as interventions to help farmers adapt to climate change, mitigate climate change, facilitate market linkages, and access complementary services. Below are some promising complementary interventions to our agriculture services:

**Climate adaptation:** Smallholder farming is as much about managing risk as it is about achieving strong bumper harvests and strong profits. Smallholder farmers are among the most vulnerable populations in the world to climate change, and these risk events are accelerating. In addition to a wide range of agricultural advisory content in our core services targeting climate adaptation, PxD also works to identify new ways to make the agricultural advice we provide more responsive to dynamic farm and agro-climatic conditions and to help smallholders manage increased climate variability and risk, and to integrate these into our services. We intend to accelerate our work helping farmers adapt to climate change in the coming years, and we view this as a particularly ripe area for expanding to services beyond solely providing agricultural recommendations. Given the high level of interest in this area from a variety of potential partners, we view ourselves as playing a key role testing new adaptation and risk management services, and scaling these to reach large numbers of farmers, and are particularly interested to partner with institutions who have complementary interests in this area. For instance, our climate adaptation work includes:

- **Weather forecasts:** As satellite technology and weather forecast models improve, there are opportunities to offer more accurate and localized weather forecasts in places where they are not available, which can be heavily customized based on the location of the farmer’s land. We are experimenting with opportunities to improve farmers’ decision making ability by providing them with weather forecasts that are more localized and based on more accurate models than currently available. This can help farmers to manage weather risks better and to optimize the timing of farm activities such as sowing, fertilizer application, or harvesting.
• **Water tanks**: In places where water availability varies throughout the year, we are working with dairy cooperatives and input suppliers to provide water tanks to livestock farmers and finance the purchase of these tanks using asset collateralized loans (ACLs), in order to smooth farmers’ income and increase milk production. These water tanks also have significant other benefits to farming households, such as reducing women’s and girls’ time spent fetching water.

• **Pest and disease alerts**: Farmers frequently ask for help with reducing losses due to pest and disease outbreaks; this is often the most requested service in PxD user research. While we already provide advice on how to deal with common pest and disease issues after outbreaks occur, there may be greater gains in helping farmers avoid outbreaks and infestation before they occur, particularly in the context of a changing climate. We hope to make additional investments here, including through behavioral nudges to undertake best practices in prevention - which often involve sustainable soil management practices such as intercropping - as well as through crowdsourcing experiments in which farmers identify and report outbreaks early in order to warn neighbors.

• **Planting date advice**: The timing of planting represents a critical decision for smallholders with big implications for increasing yields at no additional cost. However, this decision point is marked by great uncertainty in a low information environment, which is exacerbated by climate change. We are working with partners to develop models for predicting the optimal date at which farmers should plant their crops based on soil moisture, anticipated rainfall and other weather patterns, and other factors.

**Climate mitigation**: There are a variety of emerging opportunities for smallholder farmers to contribute to climate change mitigation in ways that increase their income and the long-term health and sustainability of their farms. To build on our previous work on climate mitigation, which includes advising farmers on several climate mitigation practices such as avoiding crop burning and reducing fertilizer overuse, we are working to identify additional agricultural practices, inputs, and technologies that equip smallholder farmers as agents of climate change mitigation. In this work we are prioritizing agricultural practices that generate direct tangible improvement in farmers’ livelihoods, whether through direct agronomic benefits or payments for their environmental services. We believe that we have a particularly strong role to play in connecting smallholders with these opportunities, and deploying the digital tools needed to support these opportunities. For example, we are exploring the following approaches:
- **Recommended mitigation practices:** We are conducting research to identify several agricultural practices, inputs, and emerging technologies that can potentially be used by farmers in low- and middle-income countries to reduce emissions of several greenhouse gases, including carbon dioxide, nitrous oxide, and methane, and sequester organic carbon in the soil, as well as deliver co-benefits for agricultural productivity.

- **Carbon credit payments:** We are also exploring opportunities to provide smallholder farmers with a new income stream via carbon credits that they can receive for practices that sequester carbon in their soil. We may identify similar opportunities where farm communities can receive payments for protecting forests and other critical ecosystems, or for refraining from practices such as crop burning. Our niche in pairing research and at-scale implementation means that we are particularly well positioned to develop and deploy the tech, data science, and programmatic elements that enable these services, such as remote sensing of land use, connecting farmers to digital payments, and collecting data on individual GPS markers, or to form partnerships with other organizations with this complementary expertise. Over the next few years, we hope to pilot one or more such partnerships, with the goal to scale that model in future years if it appears to have positive impact for the climate and for the farmers we serve.

**Market linkages:** We are also exploring several mechanisms to help link farmers to various markets, including input markets, output markets, labor markets, and markets for financial services. For example:

- **Asset Collateralized Loans (ACLs):** We are exploring avenues to expand the ACL model described above to other types of productive assets that can help farmers increase their incomes, adapt to climate change, and reduce risk.

- **Agro-dealer Phonebook:** We are compiling directories of contact information for agro-dealers and delivering this information to farmers based on their locations, with the potential to supplement this with real-time information on agro-dealers’ stock levels of critical agricultural inputs.

In addition to the high-value agricultural services described above which are targeted directly towards smallholder farmers, we are also exploring complementary services for other audiences within the agricultural sector. For example, there is a compelling value proposition for digital information services targeted towards extension workers that can leverage their physical
presence in on-farm visits, make their jobs easier, and improve the effectiveness of the existing in-person agricultural extension system.

**Developing high-value services in other sectors**

Smallholder farmers make up the majority of the world’s poorest people, and so agriculture is a natural sector for us to focus on. However, low-cost, highly scalable services can also improve education, nutrition, environmental sustainability, health, financial access, and other outcomes. We are currently exploring high-value services that deliver positive impact for new populations of users in new sectors by drawing on our existing capabilities in user research, product development, and digital information delivery. These include a digital learning tool for students and teachers, advising rural households on how to improve household nutrition, and helping farmers access loans and other financial services to increase their investment in productive assets. We are open to work on developing new high-value services in other sectors where opportunities present themselves, and we will pursue these opportunities if we have dedicated resources and bandwidth to do so without detracting from our work in the agriculture sector. We expect that in the next few years the majority of our expansion into new sectors will focus on agriculture-adjacent sectors such as nutrition and climate mitigation that share the same target population as our existing agriculture work.

**Increasing User Engagement and Adoption**

In addition to optimizing the value of our services for the people who use them, we can increase our impact by increasing user engagement and increasing the proportion of users who use and adopt our services. One aspect of this is improving the **user experience** of our services, particularly for users with low digital literacy. A second aspect is increasing the **persuasiveness** of our recommendations, including through the use of behavioral nudges. A third aspect is increasing the level of **customization** of our advisory messages to make them more actionable for our users. We rely on both adoption surveys and user engagement data to inform us about whether our users are likely to be reading or listening to our recommendations and adopting them. Increasing engagement and adoption has been a key theme for PxD since we were founded, but we expect to increase the rate of learning in this area through deeper investment in human centered design activities, scalable standard operating procedures for writing simple content, and deploying more rapid A/B testing.
A final way that we can increase our user engagement is by improving our user targeting. Historically, we have focused on reaching as many users as possible within a particular farmer population, and have not been very selective about which smallholder farmers to reach, largely because of the low marginal cost per user. However, the result of this approach is that we have not targeted our advice well enough on the people who are likely to adopt our recommendations. Our services typically reach many low propensity users who never adopt any of our recommendations, and some who may never even engage with our services (i.e. pick up our voice calls or read our SMS messages). This means that our average impact per user includes in the denominator many users who do not engage with the service and for whom there is zero impact. Particularly in settings where telecommunications costs are relatively high (such as most parts of Africa where they are higher than in South Asia), we should target more, to avoid incurring cost for users with zero benefit, therefore increasing the cost effectiveness of our services. This user targeting is an extension of our broader work on user customization, where an extreme form of customizing our advisory content may be to send no content at all for some low propensity users.

Scaling Strategy

Our long-term goal is to achieve impact at massive scale - to reach 100 million\(^2\) people with services that deliver significant increases in income or other measures of wellbeing. Having reached 5.7 million users in 10 countries in 2021 just six years after our founding, we believe that the scalability of our services is one of the best-validated aspects of our business model.

As we invest in increasing our impact and generating additional evidence of impact, we expect the following themes to be central to our strategy for scaling impact:

1. **Focus on cost-effectiveness at scale:** We aim to achieve impact in ultra-cost effective ways, in order to maximize the total impact we can achieve in the world and our social return on investment. Our cost-effectiveness approach relies on three tenets: 1) invest substantially where necessary in fixed costs such as R&D and content development that make our services most impactful; 2) only launch services that are likely to scale to very large numbers of users, such that these fixed costs will constitute an insignificant cost

\(^2\) These 100 million people reached will include both “current users” - those that our programs directly serve at any given time - and “graduated users” - those that are still actively served by programs and services that we helped to create or improve and that are now operated by another entity such as a government or private organization
per user; 3) design services that have near zero marginal costs, such that we can sustainably serve millions of additional users with little additional funding required. At 6.9 million users reached as of Q3 2022 for an average of $1.56 per user per year, we are already on track with this approach, and now intend to invest slightly more in fixed costs in order to double-down on increasing the likely impact per user, which we expect will also drive future scale. Although this description of the approach focuses on budgets and cost structures, we continuously emphasize that the purpose of this focus on unit economics is to maximize our aggregate positive impact over time.

2. **Impact drives scale:** In our first 6 years, we scaled rapidly, allowing us to access large sample sizes for learning and experimentation, and to learn about the generalizability of our service model by operating in a variety of geographic contexts. In the past 2 years, we have doubled down on service design iteration and experiments to increase and quantify the impact of these services. We are hopeful that continuing these investments in R&D within the coming years will position us strongly for further growth in future years, by driving demand from both partners and users.

3. **Funding mix:** We expect to fund large-scale service delivery and monitoring primarily through partnerships and service contracts with governments, bilaterals and multilaterals, and long-term institutional funders. We expect that risk capital for our R&D work as well as both restricted and unrestricted funding for our organizational development will continue to be provided through philanthropic donors, individual supporters, and research funding organizations. We are also exploring partnerships with the private sector (such as mobile network operators, agri-businesses, and others), where these align with our impact goals.

4. **Grow in existing geographies through large-scale partnerships, primarily with governments:** Because we are already active in countries representing a large proportion of the world’s poor³, we expect to focus most of our efforts toward deepening our impact and increasing our scale within those countries. We expect to continue delivering services in partnership with national and sub-national governments and locally-rooted NGOs and businesses with local presence on the ground. Both this partnership model and the focus on scaling within countries are intended to drive high cost-effectiveness at a very large scale, as well as reaping the benefits of deep investments in geographies over time. In keeping with this, to the extent that we add some new countries in the coming years, we expect to prioritize low- and middle-income countries that meet one or

³ The 9 countries where we worked in 2022 represent roughly 38% of the world’s smallholder farmers, and roughly 55% of the world’s population living under $1.90 per day.
more of the following four criteria: 1) large population, with a substantial proportion of people living in poverty; 2) locations that would particularly benefit from digital services, such as very remote or conflict-affected areas, or countries with large rural populations; 3) a particularly interested partner government or organization; and 4) a gap in the market or particular unmet user needs that can be addressed by PxD’s services.

5. **Drive impact at PxD and externally through the central role of research and evidence throughout our work:** Three of our four founders are researchers, and evidence and research remain at the core of how PxD works. As we grow, we expect to incorporate research in a variety of ways, including through ongoing rigorous experimentation to improve and evaluate our services, the use of evidence to identify the highest value information for each context and for each crop or livestock value chain (or other types of information for non-agricultural services), integration of evidence to identify new promising types of services, and partnerships with the external research community to generate new evidence and develop new types of evidence-based services. In addition to using research to improve PxD’s impact, we are continuing our efforts to contribute evidence to the global research community, and see ourselves as playing a key role in the growing evidence-to-action space. These efforts include, among other things, publishing papers and engaging with the academic research community, increasing our use of blogs and other policy deliverables, and creating opportunities for external researchers to test promising ideas through engagement and piloting with our users. We are committed to employing and providing research opportunities for researchers who come from our operating countries, particularly researchers from backgrounds underrepresented in quantitative research and economics. This strengthens our integration of local knowledge and insights in research design to keep our research approach locally-grounded.

6. **Continue to deploy a variety of models for sustainable delivery of large-scale services:** We believe that the right funding and operating model for services will vary depending on the partnership context, and we expect to continue running a variety of program models that allow our services to maintain an ongoing impact. We will draw on lessons from our past programs about the success factors necessary for each type of partnership to continue improving the effectiveness of our programs.

   a. **Build-Operate-Transfer:** We have built many of our services in collaboration with government partners with a specific focus on Build-Operate-Transfer (BOT) scaling models, prioritizing the development of simple and repeatable operations that can be run smoothly by our partners. We completed our first large-scale BOT
handover to a government in Odisha, India in 2022, and we expect to learn from and iterate on this handover process to ensure our ability to deliver long-lasting impact through the BOT model. We expect to deploy the BOT model in contexts where the scaling partner has high appetite and capacity to manage the service on an ongoing basis. When we transfer services to governments and other partners, we will seek to retain access to service data and where possible we will maintain an ongoing M&E role to ensure that these services continue to be monitored and can adapt to farmers’ changing needs over time.

b. **Build-Operate:** In some contexts, partners may prefer for PxD to continue to deliver our programs, and we are happy to continue this as long as programmatic funding is available to do so, either from a partner or a long-term donor. We have found that programs that we operate in the long term can be particularly fertile ground for organizational learning, and it is easier to guarantee long term program delivery quality; however, we have at times faced challenges sustaining funding for Build-Operate programs. Before launching Build-Operate programs in the coming years, we will aim to identify likely long-term sources of program funding to ensure that the service is sustainable over several years.

c. **Partner Advisory:** For partners who already operate digital services at scale, PxD has achieved particularly cost-effective impact serving in an advisory capacity, where PxD draws on our expertise to conduct research, product development, and data analysis to support improvements to an existing service, thus creating impact while avoiding the ongoing delivery costs for PxD. We have found that the effectiveness of this model depends heavily on the strength of the partnership, including PxD’s understanding of the partner’s programs and interests, and the partner’s enthusiasm and capacity to implement findings from joint R&D. We expect to deploy this model in contexts where we find enthusiastic partners with appropriately scaled services.

**Implementing the Strategy**

**Innovation Lab**

As described above in the Impact Strategy section, there are many possible ways in which we can have increased impact for our users, and to implement this impact strategy we are committed to using rigorous evidence and deep user research to identify and prioritize which
ideas to pursue. For each potential new idea, we will ask ourselves a series of questions, including whether the idea addresses an important challenge for users, whether we can develop a service to address this challenge, what the potential impact of the idea will be, and what the evidence tells us about the answers to these questions.

One practical way that we intend to operationalize this impact strategy is by establishing an Innovation Lab to help us answer these questions, and to identify and prioritize the most promising opportunities, so that we can focus our resources on the ideas that are most likely to be successful, and deliver long-term, sustainable impact at scale. We are actively pursuing funding to launch this Innovation Lab to improve our existing services and to catalyze the next generation of high-value PxD services. The Innovation Lab will be a joint initiative of PxD’s Country Program Teams, Research Team, and Product & Technology Team, which will work collaboratively to improve the impact of the services we offer.

**Target Geographies**

PxD’s user reach in 2022 included smallholder farmers in 9 countries (Bangladesh, Colombia, Ethiopia, India, Kenya, Nigeria, Pakistan, Rwanda, Uganda) across 3 continents (Africa, Asia, and Latin America). PxD is open to working in any low- and middle-income countries, with a focus on services that serve poor or marginalized people within those geographies.

Currently most of our focus is on South Asia and sub-Saharan Africa because that is where the majority of the world’s very poor people are located, and we expect that South Asia and sub-Saharan Africa will remain a primary focus for the next several years. Additionally, in the short term, it is our intentional strategy not to proactively pursue expansion into new geographies, but rather to invest in improving our impact per user and growing internally in PxD’s existing geographies, which have significant room for expansion.

However, we would consider expanding geographically if presented with an opportunity of a high quality partner to work with and substantial, long-term funding, ideally coming from a diverse mix of funders. To prioritize opportunities for geographic expansion, for each country or sub-national geography we consider objective criteria such as the number of smallholder farmers (or other potential users), the level of poverty, mobile phone penetration, and measures of the operational landscape that inform our ability to operate in each geography. In the medium term, we welcome opportunities to work in countries in other regions such as Latin America, in which we launched our first program in Colombia in 2021, and Southeast Asia, which contains several potential high-impact, high-scale countries. Although these regions generally consist of
middle income countries, with users that have higher incomes than those in sub-Saharan Africa or South Asia, they also represent significant opportunities for PxD with governments that are more willing and able to fund our services directly and higher penetration of mobile phones, and smartphones in particular.

Because our services are digital, they may be particularly appropriate to reach people for whom traditional agricultural extension and other in-person services are not available or are very expensive to provide, such as those in Fragile, Conflict-affected and Vulnerable (FCV) settings. We have begun to test this hypothesis with services in conflict-affected geographies in Northern Nigeria, and are interested in adding additional programs in other conflict-affected geographies where digital services may have a comparative advantage.

**Partnerships**

To reach our long-term goal of 100 million users, and to take advantage of economies of scale and declining fixed costs per user in each program we operate, we aim to reach as many users as possible in each geography. Partnerships are critical to our scaling strategy, and we have worked with many leading global organizations as both implementation partners and funding partners. Partnerships with scientific and knowledge partners are also critical to develop high impact services. Our strategic partnerships include the following categories of partners, and we are seeking additional partnerships in each of the categories described below to continue to scale our work to reach millions more smallholder farmers in the years to come:

- **Governments:** Our primary pathway to scale is through partnerships with LMIC governments at the national and sub-national level to bundle our digital agricultural advisory services with other complementary services that governments provide to their citizens, such as in-person agricultural extension, agricultural input subsidies, income support payments, and other government schemes. These governments typically have large databases of farmers that have been the beneficiaries of various schemes, providing a rapid pathway for PxD to scale by targeting these users. Furthermore, governments are typically the largest providers of agricultural extension, often financing these extension programs directly with their own domestic resources. If just a small percentage of public agricultural extension budgets were redirected to digital extension, it could dramatically increase the reach, impact, and cost effectiveness of these extension programs.
• Non-Profits: PxD also works with many non-profit partners, including implementers of other complementary services that provide a pathway to scale by bundling digital extension, as well as agronomic research centers that develop content that PxD can integrate into its advisory services. Like governments, these non-profit partners provide a wide range of services to farmers, and typically have large databases of existing users, reducing user acquisition costs.

• Private Businesses: PxD is also eager to unlock alternative scaling pathways by partnering with private businesses such as mobile network operators (MNOs), agricultural input suppliers, output buyers, and providers of other agricultural services. These partners often have a strong incentive to partner with PxD to provide digital extension to farmers either as a value-added service to increase customer loyalty (in the case of MNOs), or as a way of increasing farmers’ purchases of agricultural inputs (in the case of input suppliers) or sales of outputs (in the case of output buyers). Where there is clear alignment between the business’s interests and PxD’s interest to generate positive impact for very poor people, by developing partnerships that are win-win for both the farmer and the for-profit partner, PxD has the opportunity to generate revenue while keeping services free for users. As a guiding principle, in all of its partnerships PxD prioritizes positive impact for the user, and does not enter into any partnerships that would exploit or extract value from farmers or where we aren’t confident that they would deliver positive impact for farmers.

• Agricultural Scientists and Research Institutions: PxD regularly collaborates with individual scientists as well as research institutions to support and validate our agricultural advisory content as well as partner more strategically to advance questions of mutual interest. For example, we have worked with India’s Central Institute of Cotton Research (CICR) and the Better Cotton Initiative (BCI) to develop our cotton agronomic advisory and India’s National Dairy Research Institute (NDRI) and the Centre of Excellence for Dairy Skills in India (CEDSI) to develop dairy advisory services. Examples of our strategic partnerships include our exploration of agrodealer-based maize seed interventions in Kenya with CIMMYT, which has an extensive maize breeding program, to develop and conduct a market intelligence panel survey of more than 1,000 agrodealers in the country. Another example is PxD’s partnership with the Institute for Governance & Sustainable Development, a leader in the climate change space, to identify opportunities for smallholder farmers to act as agents of climate change mitigation while earning direct tangible returns to participating smallholder communities, whether through payments for their environmental services or private agronomic benefits.
Researchers in Behavioral Science, Economics, and Empirical Methods: PxD partners with research collaborators and organizations in the design and implementation of services and research studies to bring in external perspectives and expertise that add value to our work. Some engagements build on existing programs and data where PxD may identify opportunities to improve and tweak programs that partners are implementing, offer a digital add-on component of a program, or analyze data collected or held by our partners. Other engagements may jointly design and evaluate new interventions where PxD works closely with partners to conduct scoping and due diligence of potential new interventions and to develop rigorous research designs.

Multilateral and Bilateral Funders: Our long term goal is that in addition to direct LMIC government financing, most of the funding for our long-term service delivery will be from the large-scale institutional funders that support governments’ agricultural programs. These include multilateral funders such as the International Fund for Agricultural Development (IFAD) and the World Bank which often provide grants and sovereign loans to LMIC governments, as well as bilateral funders such as the United States Agency for International Development (USAID), the UK’s Foreign Commonwealth and Development Office (FCDO), and others. We have already received significant funding from these multilateral and bilateral funders to support our work in Ethiopia, Kenya, Nigeria, and Pakistan, and we expect to achieve financial sustainability for long term service delivery through these funders.

Private Philanthropy: To support one-off investments such as research, product development, innovation, and PxD’s organizational development, PxD also works with private philanthropic funders such as the Bill and Melinda Gates Foundation (BMGF), the Wellspring Philanthropic Fund, GiveWell, and others. We expect these funders to continue to play an important role in the future, even as they become a smaller proportion of our funding over time. In some cases, these private foundations may also support long term service delivery.

The following is a list of PxD’s programs and partnerships in our four largest markets:

- **Ethiopia:** We have reached 500k farmers with agricultural advice on 21 crops and 4 livestock value chains, in partnership with BMGF, FCDO, the Agricultural Transformation Institute (ATI), Ministry of Agriculture (MoA), and Digital Green. Our work includes improving ATI’s digital advisory platform and building PxD’s own proprietary platform.
• **India:** We have reached more than 3 million farmers in 6 states with agricultural advice on rice, cotton, coffee, dairy, fisheries, and other value chains. This includes our flagship program in Odisha in partnership with BMGF and the Odisha state government, and programs in other states with funding from the World Bank, the Walmart Foundation, in partnership with non-profit and for-profit partners including the Self Employed Women's Association (SEWA), Pradan, BigHaat, the Sustainable Trade Initiative (IDH), AgroStar, and other partners.

• **Kenya:** We have reached 1.3 million farmers with agricultural advice on 11 crops in partnership with the Ministry of Agriculture (MoA), One Acre Fund, Safaricom, and other partners, and with funding from the World Bank, IFAD, and others.

• **Pakistan:** We have reached 1.6 million wheat, cotton, oilseed, and dairy farmers with agricultural advice and high resolution weather forecasts in partnership with IFAD and the Punjab state Agriculture Department.

**Organizational Development**

To follow through on the potential of PxD's strategy outlined above, and to keep our organizational development in lockstep with our programmatic growth and development, we are determined to be more focused with the resources we have, and to continue to grow to become a more impactful and agile organization going forward. During this four-year strategy, we plan to make key investments in PxD's organizational development to improve our organization and enable us to combine agile, localized decision-making with central support, robust systems, and accountability for impact. We plan to proactively pursue both restricted and unrestricted funding from a wide range of funding partners to achieve these organizational development goals. These investments in PxD's organizational development are highlighted in Appendices on PxD's approach to [Diversity, Equity, and Inclusion](#) and [Governance](#).

**Scale and Budget Projections**

Below we summarize our projected scale and budget projections under two scenarios - a budget constrained scenario and a high growth scenario. We project that to fulfill the goals laid out in this 4-year strategy, we have a total funding need of roughly $65.5 million for the period of 2022-2025 under the high growth scenario. This total budget is dependent on several factors, including the availability of funding, our ability to develop new programs and partnerships, and the rate of programmatic growth within our existing programs and geographies.
<table>
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<tr>
<th>Year</th>
<th>Number of Users - Budget Constrained Scenario</th>
<th>Number of Users - High Growth Scenario</th>
<th>Programmatic Budget(^4) - Budget Constrained Scenario</th>
<th>Programmatic Budget - High Growth Scenario</th>
<th>Budget - Innovation Lab</th>
<th>Total Budget</th>
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<tr>
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<td>$57.9m</td>
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</table>

\(^4\) Note that total cost is not equal to user reach multiplied by our cost per user for two reasons: i) we calculate our cost per user as a weighted average based on how many users were being served at each point throughout the year, and ii) our user reach includes some graduated users for whom we do not incur costs.
Appendices

Evidence of Impact

Existing evidence demonstrates the proof of concept for digital agricultural extension services. Several studies show that demand for digital extension services is high and that the provision of digital advice can result in behavior change (Larochelle, et al., 2019; Cole and Fernando, 2021). Furthermore, in a review of six studies, researchers found that farmers who received mobile phone-based advice were more likely to adopt both a newly introduced technology (agricultural lime) and a technology farmers were more familiar with (chemical fertilizer) (Fabregas et al., 2022). In a meta-analysis of seven other studies, including several conducted by PxD research affiliates, researchers found digital agriculture interventions increased yields by 2.3% on average\(^5\), and postulated that true returns might be higher when accounting for spillovers (Fabregas et al., 2019).

The magnitude of these effects, in a context of low informational delivery costs and relatively small changes in input and labor costs, suggest that these interventions are extremely cost-effective. By extrapolating the impact of lime application from agronomic trials, Fabregas and co-authors estimate that the profit increase per treated farmer is between 10 and 100 times the per farmer cost of implementing the programs (2019). In a separate study which applied the aforementioned yield increase estimate from Fabregas et al. (2019), Cole and Fernando calculated a benefit-cost ratio of 7.7:1 for a similar mobile phone-based advice service (2021).

Diversity, Equity, and Inclusion

PxD is an international organization powered by a diverse and decentralized team. We believe that the diversity of our employees, their backgrounds, and experiences make us more sensitive and responsive to the needs, challenges, and aspirations of our users.

We are committed to strengthening diversity, equity and inclusion within our organization, not only because we believe that the unique perspectives, experiences and voices of our colleagues

\(^5\) This 2.3% average impact is based on updated impact estimates from the seven underlying studies included in the meta-analysis, and is an update from the estimate of 4% which was published in the original meta-analysis. The results in the meta-analysis conducted by Fabregas et al. (2019) represent an intent-to-treat (ITT) effect, rather than a treatment-on-the-treated (TOT) effect. In essence, the total impact of the program is “spread out” across all members of the treatment group, and includes farmers who engaged with advisory content and implemented recommended actions, as well as those who did not. The impact on yield among farmers who interact with the content (TOT) is likely to be significantly larger than the 2.3% average yield gain across the seven studies reported in the meta-analysis (ITT). We are unable to estimate the average impact on yield among those who interact with the content (TOT) because most studies included in the meta-analysis do not report what proportion of farmers in the study actively engaged with the content.
should be affirmed and celebrated but because we believe this makes us more effective in the work we do.

We believe emphatically in the importance of questioning the status quo, challenging inequity and affirming the value of inclusion.

While we are proud of PxD’s work so far, we recognize that there is so much more to be done. We hope to learn from each other, from other organizations and experts, and from the communities we serve, and to share our learnings as this work evolves in this working document.

Diversity and inclusiveness of staff:

We strongly believe that PxD’s leadership should reflect the diversity of our staff, the places where we work, and the communities with whom we work. We prioritize hiring leadership, and programmatic and service delivery, and research and operational staff from within the countries where we work. We are diversifying our recruitment networks, ensuring that our job advertisements use inclusive language, removing bias from job descriptions and creating diverse interview teams, to ensure that we attract and retain the best talent.

PxD’s Board of Directors does not reflect the demographics of our teams and is not representative of the communities where we work. Our organizational and Board leadership is cognizant of this misalignment and will work to progressively realize greater demographic representation and diversity of professional and life experience on our Board.

At PxD, we promote localized decision-making because we believe that local teams are best placed to weigh and understand local conditions and contexts. We expect our teams to be intentional about how we engage with, and impact, the communities we serve. We are also working to:

- Introduce a peer support program and offer inclusive and equitably accessible professional development support and growth;
- Create paid internship opportunities for individuals who are resident in the countries where we operate. PxD believes strongly that interns should be paid for their work;
- Introduce a new, transparent compensation and promotion framework;
- Implement flexible working to suit and support employee’s needs, for example having flexible start and finish times, and working from home.
- Offer leadership and management support;
- Review and update our policies, and;
Enhance our performance review system to support a culture of feedback, openness and communication.

Governance

PxD has in place an efficient and effective system of governance:

- A small, highly expert, very engaged Board of Directors. Additional members will be appointed to increase the diversity and relevant skills and experience.
- A growing Advisory Board to play a critical role in providing insights, guidance, networking opportunities and ideas to complement the knowledge and access of our board and staff and increase the effectiveness and efficiency of our work.
- Registered entities and partners in the US, UK, India, Kenya, and Ethiopia, and partnerships that have allowed us to establish operations in Pakistan and other countries.