



## 1.02 Democratise precision agriculture technologies

**The Solution:** Build new public/private partnerships (PPPs) - possibly through a ‘deal room’ adjacent to the Summit - that will fulfil the right of poor smallholder farmers (men and women) to access [precision agriculture](#) information, enabling them to grow enough food for their families.

**Source of the Solution:** This emerged initially through ideas submitted by the public and was built out by Working Group members with input from a number of external experts, including the Dutch government, IFPRI, and several possible PPP participants.

**Problem addressed within food systems:** High-income farmers benefit from [increasingly precise access to information](#) that enables them to tailor their planting practices and input decisions to the unique conditions of their fields. However, these precision agriculture tools do not reach poor smallholders, and without this critical information they struggle to produce enough food to meet the nutritional needs of their families and are unable to evaluate market opportunities and demand.<sup>1</sup> These farmers often lack accurate weather analysis on *when* to plant and information on *what* to plant based on the unique soil characteristics of their fields. For smallholder farmers with often an acre or less of land to cultivate, small variations in the production conditions – increasingly hard to predict due to climate change – can have large impacts on their farm output and food security. Without public partnerships, the growing number of companies developing precision agriculture tools do not have the financial incentive to ensure truly low-income populations can access production, input, and market information via their technology.

**How this solution will address that problem:** If targeted, data-driven precision agriculture information can be provided to the poorest farmers on the planet, via cost-effective and accessible technology, then hunger and malnutrition rates for these populations can be sustainably lowered through their own ability to grow more of the food they need to meet their daily nutritional needs and to sell to earn income.

The key inputs can be drawn from existing ag-tech companies that already generate precision agriculture recommendations through collecting, analysing and distributing information to farmers. For example, by using targeted SMS (for feature phones) or smart-phone apps to push out messages on seed variety choice, fertiliser choice and advice on when to plant, harvest, etc.<sup>2</sup>

The necessary action is to *de-risk and incentivise* the decision for these companies to provide low-income farmers with access to information via their technology. Adoption is lagging in low-income settings due to a range of significant market-failings limiting the delivery of these services to poor farmers. These include issues like the affordability of mobile data, access to hardware and charging capacity, and low digital literacy rates. A new PPP forum should be established, possibly initiated through a “deal room” adjacent to the Summit, that would incentivise select ag-tech companies to serve lower-income farmers. Through this, governments/donors could provide political heft to help companies deliver targeted cost reductions to poorer clients: for example, negotiating with telecoms to provide reduced data rates and broaden network coverage in areas with high food insecurity. They could provide guaranteed financing to distribute affordable bundles of hardware, such as feature phones paired with solar charging stations. Or they could provide direct public subsidy to pay for services that target the particularly vulnerable, such as women who face the largest digital literacy gap. Finally, they could develop and coordinate multi-stakeholder partnerships that bring on board organisations with an embedded field presence to drive tech

<sup>1</sup> In Ethiopia for example, nearly a quarter of households that are engaged in crop and/or livestock production (about 68% of all households) are food insecure.

<sup>2</sup> While we focus here on production-related agricultural information, other valuable information goals – like nutrition behaviour-change – can efficiently be layered onto the same platforms.



adoption; for example, working with school-based agricultural extension programmes to empower youth to improve the digital literacy of their parents.

In putting forward this solution, we assume a smallholder target group that can access new inputs, like fertiliser and seed varieties, recommended by the precision ag tools. We assume any risk of politicisation or abuse of personal data that is collected from farmers by private companies can be mitigated via more public involvement in their scaling.

**Solution’s alignment to the ‘game changing and systemic solution’ criteria:** The majority of the world’s nearly 600 million farms are small farms, and small farms ( $\leq 20$  ha) produce more than 75% of most food commodities in several LMIC regions<sup>3</sup>; most of these farmers have not yet adopted precision agriculture techniques, indicating major potential for scale. We live at the cusp of a more technology-centred agriculture era that should advance us on the path to “zero hunger” under SDG 2, with governments eager for their rural constituents to achieve their right to information by accessing this technology. However, without more public involvement in the growing ag-tech marketplace, instead of leveraging market forces to drive down hunger rates for poor smallholders, we risk excluding them from this new digital revolution.

In terms of sustainability, there is already an increasingly robust precision agriculture information ecosystem, which the market is largely developing on its own. This includes companies like GRO Intelligence, which [just raised \\$85M in Series B funding](#) to scale its collection and analysis of agricultural data, or Kenya-based [Arifu](#), which provides its paying institutional customers access to mobile-based tools and content to engage their audiences, including rural smallholders (who receive the content for free). With roughly 40% of their revenue from commercial partners (e.g., Safaricom, Kenya Commercial Bank or EthioChicken) and 60% non-commercial (e.g., the World Bank, CGAIR or Technoserve), Arifu has built a clear path to profitability. And while we know it is difficult to get poor farmers to pay for knowledge, AgriCoach is piloting a [subscription service](#) in Burundi where farmer community groups receive crop selection advice. However, these companies lack the resources to significantly close the gaps preventing the poorest farmers from accessing their services, even though they might become future customers; public investment could help bridge this gap.

**Current/likely political support:** Donors and governments clearly recognise the value of precision agriculture as a key anti-hunger tool. The 2021 Climate Adaptation Summit recently [highlighted](#) the need “to rapidly scale up digital tools to increase...agricultural yields (for) excluded communities,” which builds on a [concrete commitment](#) to scale these to 300 million farmers. The Dutch government, a clear leader in this space, has already invested directly in addressing this problem through its Geodata for Agriculture & Water [programme](#) (G4AW), which supports [25 partnerships](#) that provide digital advisory services to smallholders, and which could become a model for coordinating a much wider and larger pool of public investment.

**Contexts where this is well/not well suited:** As smallholders must be able to access new inputs to fully benefit, certain populations – e.g., in fragile states or remote areas – might benefit more from other interventions, like cash transfers.

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<sup>3</sup> Herrero et al. 2017 Farming and the geography of nutrient production for human use. *Lancet Planet Health* 1: e33–42; Lowder et al 2016. The Number, Size, and Distribution of Farms, Smallholder Farms, and Family Farms Worldwide. *World Development* 87: 16–29.