

Making Productivity Enhancements for Smallholder Farmers

HIGHLIGHTS

- Agricultural equipment designed for use in small farm plots make it feasible for farmers to shift from labor-intensive practices to higher-yielding mechanized practices.
- Inputs are made affordable by providing flexible payment options and savings based input packages.
- Farmer education services bundled with inputs help farmers understand accurate usage and application of inputs, thereby increasing their trust in improved inputs.



Dominic Chavez / World Bank

Development Challenge

Approximately 80 percent of the field plots in Asia and Sub-Saharan Africa are managed by smallholder farmers. Farmers from these regions continue to face challenges in productivity and crop quality. Smallholder farmers are unable to access quality inputs, and even when they can access superior inputs, they lack the know-how and expertise on how to use these inputs effectively. Further, these inputs are often unaffordable for smallholders, resulting in lower adoption rates. Smallholder farmers and pastoralists are often remotely located and underserved by input retailers. These farmers therefore lack access to crop productivity boosters such as climate-resistant seeds and organic fertilizers, and critical livestock inputs such as animal health services and nutritious feed.

Business Model

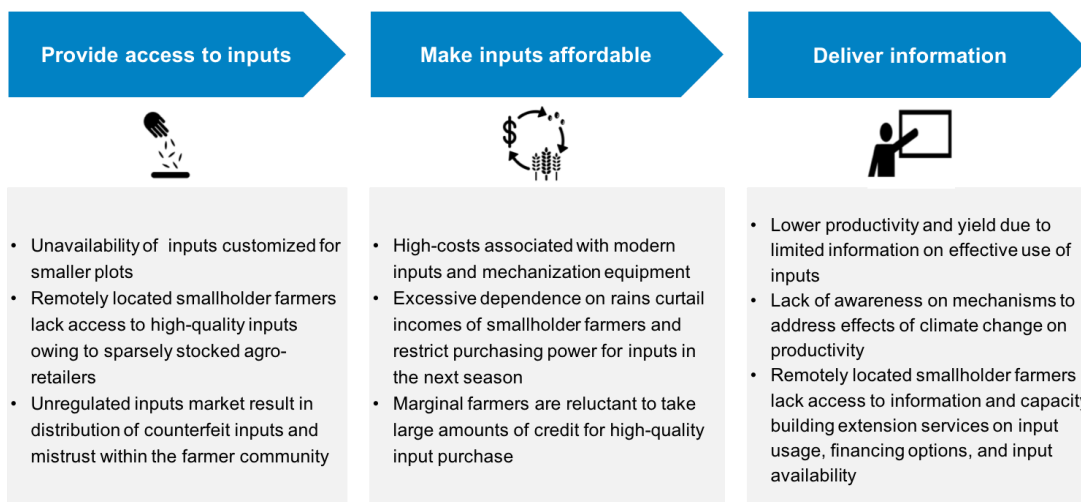
Several enterprises address challenges faced by smallholder farmers in the pre-harvest stage. They provide access to inputs, make inputs affordable and disseminate information about solutions to enhance agricultural productivity.

A number of enterprises design inputs and machinery for use in small plots. For instance, Kamal Kisan’s products are designed for use in farms that are smaller than two hectares and enable farmers to substitute labor-intensive processes thereby decreasing dependence on labor and associated labor costs.

Enterprises enable marginal farmers in reducing costs incurred on inputs and farming. They manufacture low-cost products that are sold in smaller affordable packages; provide installment financing to lower the burden of upfront costs, and sell inputs to a group of farmers who share the costs and further lease it to other farmers. myAgro, a company operating in Mali and Senegal provides a savings-based mechanism for farmers to buy input packages of their choice, which could include different types of seeds, fertilizers, and training services.

Eruvaka Technologies, a company based in India, offers data-analytics supported aquaculture equipment that enables farmers to monitor their ponds through a smartphone and adjust the amount of fish feed based on water quality and weather data.

Features of Productivity Enhancements Business Models



Implementation: Delivering Value to the Poor

Awareness

Field agents conduct frequent meetings with farmer communities to disseminate information about the enterprises' products. They demonstrate the inputs and equipment in training sessions and engage trained agro-experts to sell their inputs. Some enterprises partner with local and popular media to showcase their products and services. Enterprises also rely on early adopters to spread awareness about their products within their local communities. Local government agencies, research organizations, universities and NGOs also play a pivotal role in aggregating farmers and educating them on the benefits of yield-enhancing inputs.

Acceptance

Close interaction with smallholder farmers and customization of inputs and equipment to suit farmer preferences are key factors in winning acceptance. Crop production will not intensify if the equipment is not adapted to social, economic and environmental conditions. SAS Motors develops machinery that is suitable for use in small-scale plots in India; the enterprise has a low-cost light-weight mechanized plough that is designed for use by women working in small fields. Enterprises also engage with local champions including village leaders, notable farmers, and Self-Help Group leaders to educate farmers and receive feedback.

Accessibility

Enterprises need to establish effective last-mile delivery channels to reach smallholder farmers in remote rural areas. Some enterprises adopt a high-touch model wherein they deliver productivity enhancement solutions directly to farmers. Other enterprises build innovative partnerships for effective distribution. Hydroponics Africa partners with the Ministry of Agriculture in Kenya and trains its local county extension workers to deliver and install systems in farms.

Affordability

A number of enterprises sell inputs in different package sizes at differentiated prices, thereby allowing farmers to purchase inputs in smaller increments at prices that they can afford. Enterprises such as Kick Start International and myAgro provide innovative financing options such as savings-based payments, rent-to-own models and variable pay-as-you-go strategies. Bundling value-added services such as delivery, installation, after-sales services and agronomy support makes it cost-effective and simpler for smallholder farmers to trust and adopt productivity enhancing inputs.

Costs incurred on research & development, product design and testing constitute a significant share of the overall costs for enterprises providing productivity enhancement solutions. The team interacts with smallholder farmers to understand the nature of labor intensive activities, prevalent cropping methods and the intended benefits of mechanizing an activity.

Enterprises also require significant working capital to maintain inventory and ensure continuous supply of inputs to farmers in remote areas. Since enterprises need to educate smallholder farmers about the benefits, they also incur costs toward hiring field agents and agronomy experts, and establishing demonstration plots to conduct training sessions.

Revenues are generated through sales of pre-harvest inputs such as seeds, feed, fertilizers, crop protection solutions, irrigation systems, farm machinery and equipment. Enterprises also earn revenues by providing training and agronomy support.

To be cost-efficient, enterprises aggregate farmers for research and testing of inputs, leveraging partners such as non-governmental organizations, government-employed county extension workers and farmer co-operatives who engage directly with farmers. Enterprises partner with farmer co-operatives, farmer groups, agricultural research organizations and rural agriculture universities to conduct research and test prototypes of inputs and farm equipment

Results and Effectiveness

Productivity enhancement input enterprises not only tailor agro-inputs and machinery for use on smallholder farms. They also make these inputs cost-effective for farmers to use and invest time in imparting the requisite knowledge on the benefits of using these inputs. Farmers in turn are able to access low-cost quality inputs, make their pre-harvest processes more energy and water efficient, increase their families' food security, health and nutrition.

For example, apart from cost saving for farmers, SunCulture's irrigation kits enabled saving of 171 million liters of water and 360,000 liters of diesel fuel in a year; using its systems as an alternative to traditional irrigation kits also helped in reducing 397,440 kilograms of carbon dioxide emissions. Similarly, Hydroponics Africa enabled urban slum households to install its systems on rooftops and vertical walls, thereby increasing food security for low-income urban farmers. The enterprise's systems also helped farmers conserve water in their cultivation processes.

According to a 2015 study, smallholder farmers can increase net annual incomes by 80 percent to 140 percent with access to productivity-enhancing technologies such as improved seeds, micro-irrigation systems or improved cow breeds. Enterprises providing drip irrigation, solar-based pumps and hydroponic technology enable farmers to substitute energy and water intensive farming techniques.