SEEING IS BELIEVING - EMPOWERING FARMERS WITH SMARTPHONE IMAGING

Locations	India
Dates	01/10/2017 - 31/12/2020

Summary

Many farmers in India still rely on inefficient agricultural practices that are unsuited to climate change. Data can help them. Customized advice, based on localized weather and soil data, pests and diseases, as well as input availability, can improve management practices, productivity and profitability. This project used crop pictures, taken by farmers using their smartphones, as part of wider personalized advisory services that aimed to strengthen advice and help farmers make timely decisions. Images supplied were also used for Picture Based Insurance (PBI) services to support sustainable and scalable risk management.

The problem

Agriculture is the largest source of livelihoods in India but the sector is known to be resource-intensive and regionally based (FAO). So, it is vitally important that

farmers grow as much as possible.

But many issues affecting crop growth exist, including pest and disease damage, leading to declining profits for the farmer, impacts on the agricultural value chain and ultimately the food security of the nation.

One way to negate these impacts is for farmers to receive practical, relevant advice, and millions of farmers around the world depend on accurate crop forecasting information to improve the quality of their crops and better manage their land. However, a vast majority of smallholder farmers have little access to agricultural information or public 'extension' farming agents and, therefore, accurate diagnosis and well-timed interventions are a major concern for smallholder and marginalized farmers.

Digital development can help bring practical and timely agricultural knowledge to smallholder farmers and help them to lose less and grow more healthy, nutritious and profitable crops.

Technological interventions in the agriculture sector can also make the sector more attractive to young farmers and reach more female farmers.

What we are doing

Remote sensing technology (satellites or aircraft sensors) has been used for some time in agriculture to collect data, detect and monitor crop patterns. In this project, the focus was on providing remote advice to farmers based on picture-based crop monitoring, with the aim of aiding agronomic advice, empowering farmers to optimize their decision-making and reduce risks and losses both in crops and income.

The project provided picture-based advisories (PBA) (ie remote advice to farmers), based on picture-based crop monitoring. An app was developed to allow farmers to register their agriculture sites and send pictures of affected crops, together with weekly repeat images which helped experts identify growth patterns of the crop. After assessing the images, Plant Doctors (from Plant clinics, part of the Plantwise programme) would recommend the best remedial measures.

The initiative provided personalized agricultural advice, not only based on localized information but also on visible crop characteristics. It included the application of scientific research and knowledge to agricultural practices through farmer training.

Phase one of the project successfully tested this strategy and phase two extended the reach of the advisory services along with providing Picture Based Advice (PBA) bundled with Picture Based Insurance (PBI) services which focused on assessing crop losses based on the images sent by the farmers throughout the season. The PBI product is offered by HDFC Ergo insurance company in partnership with the International Food Policy Research Institute.

Key activities:

- Preparing and validating content for Paddy and Groundnut crops covering the entire package of practices from sowing to harvest.
- Providing personalized remote advice based on the pictures sent by the farmers to improve farmers' knowledge of recommended practices.

Results so far

We believe, as a result of the project work, that real-time crop images from farmers' smartphones strengthen agricultural advice in four ways:

1. Visible characteristics provide more information, allowing agronomic experts to target individual messages.

2. The tangibility and ease of a picture-based approach encourages farmers to take-up the advice.
3. Collected camera data can be stored and organized in a systematic way for different types of plots, weather conditions and practices, empowering both farmers and experts to detect patterns of how they relate to crop growth.
4. A clear business case that has led to insurance providers using camera data to assess crop damage, pay farmers fairly and work with advisory services.

In phase one, activities were carried out in the Indian state of Haryana. The focus was on selected crops and training local experts to track visible plot characteristics over time using a stream of pictures from farmers. CABI used its own flagship Direct2Farm (D2F) programme to develop tools to give personalized agricultural advice on a variety of crops to farmers.

Phase two, carried out in Tamil Nadu which has three cropping seasons, started in May 2019 and was built upon the CABI Plantwise programme. Throughout season one (Kharif 2019 (summer/monsoon season)) and season two (Rabi 2019 (winter)), 1500 paddy and groundnut growing farmers were reached in 50 villages in Pudukottai, Thiruaiyaru and Villupuram district in Tamil Nadu. Village sessions were conducted to build awareness of the PBA concept amongst farmers and the app was installed onto farmers' smartphones.

350 farmers were targeted in season three, with all of them receiving remote advisories based on crop images sent. Out of these, 175 farmers received the bundle of advisories with insurance pay-outs based on visible crop damage shown on the uploaded images.

For insurance providers, the supplementary information provided by farmers allows them to provide improved financial services to farmers at lower prices with better insurance pay-outs at lower costs.

For farmers, the insurance aspect increased the interest in the uptake of the service and farmers were keen to invest more in agriculture inputs as a result.

A study conducted after season three found that 82% of farmers applied the provided picture-based advice, 76% farmers agreed the advice was based on the pictures and 65% farmers adopted rational use of pesticides.

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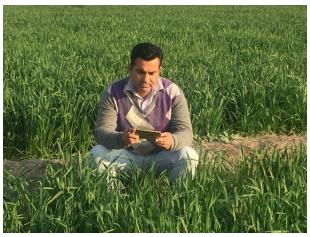
CABI Project Manager	Arun Jadhav



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