Digital innovations are giving farmers in Cambodia accurate weather forecasting for higher agricultural yields

How digital apps and services are boosting agricultural production

During the severe 2015-2016 El Niño related droughts, dry water supplies meant smallholder farmers in Cambodia saw a 20% decline in rice harvest. This forced many farmers into debt and widened the annual hunger gap.

Lack of free public access to reliable weather forecasting information in Cambodia limits farmers' abilities to plan for, and mitigate, severe weather conditions and the hazardous effects it might have on crop production.

Restricted access to reliable weather information continues to undermine and hinder disaster-preparedness efforts of farmers, civil society organisations and the public sector who try to improve livelihood and resilience from extreme weather conditions affecting Cambodian farmers.

The key is innovation.

In a continued effort to build resilient communities for Cambodian farmers, DCA Cambodia has developed the **AGILE Project: AGricultural Information for Livelihood Enhancement.** The project is exploring new ways of working in agriculture that harness digital, technological and process innovations, rendering it more efficient and providing new opportunities for rural farmers in Cambodia.

Here are 3 examples of how the AGILE Project has fostered partnerships to promote digital and process innovations to support farmers to improve their agricultural production in Cambodia.

1. Partnerships and platforms for innovation

The initiative is supported by the DCA Innovation Fund, adding to contributions from ECHO and the country programme. Funds have supported the AGILE Project to further develop an app and purchase a local weather station. Data collected from this station is being made publicly available, shared with stakeholders and collected to provide inputs to the *Drought Information Hub* – a wider project bringing together data from government and private sources to provide an overview of the drought situation in Kampong Speu for real-time dissemination to farmers and the public.

DCA has partnered with *Life with Dignity* and *Life and Soil* *(Vivre de sa Terra)* two local NGOs supporting community organising and assessment, and providing crop database development and agricultural advice. DCA and partners are working closely with the Khmer Organic Cooperative, AMK Micro-Insurance and the Royal University of Agriculture (RUA) to hand over the running of the weather station after the DCA lease ends in 2019.

To process and interpret the weather information, DCA and IT developers have created a simple algorithm; taking precipitation and temperature recordings and transforming it into recommendations for the farmers. As the AGILE Project scales-up, this algorithm can be expanded to include more weather conditions and recommendations.

2. Digital innovation

The main component of the AGILE Project has been the development of the *Smart Farmer* app – a crop advisory service for smallholder farmers in Cambodia using the information gathered from the DCA-owned weather stations. It aims to provide farmers with accurate, appropriate and up-to-date information on changing weather conditions.

Real-time forecasting (up to 10 days) is matched with risk-mitigation techniques to provide actionable information to communities and governments on disaster prevention.

Weather forecasts 3 to 4 days in advance will help farmers plan for the short-term, and answer simple questions like, *should I water my crops today? Will there be critical weather changes in the next few days?* Longer-term weather forecast predictors will provide advice on the types of crops to plant and when, *whether it be cucumbers, tomatoes, watermelon or rice*. Simple information and guidance is given to help farmers maximise their crops and address concerns like, *how will too much rain effect my crops*?

Data generated from the weather station is being stored in a cloud database, processed and shared to the head of the farming cooperatives, who represent farmers in the field. 80% of the producers, agriculture input suppliers, academics and cooperative members own a smartphone and can share important information to other members and colleagues.

Smart Farmer runs on a standard Android phone and is available in both Cambodian language and English. Click here to access the online prototype.

3. Process innovation

Over a six-month period, the AGILE Project conducted several processes of project designing, testing and collaborating with farmers, developers and academics to ensure a suitable product was designed to meet the farmers' specific needs.

Numerous ideas on concept, design, features and functionality have been explored:

1. **Phase one** included a discovery phase with focus groups and in-depth interviews with stakeholders.
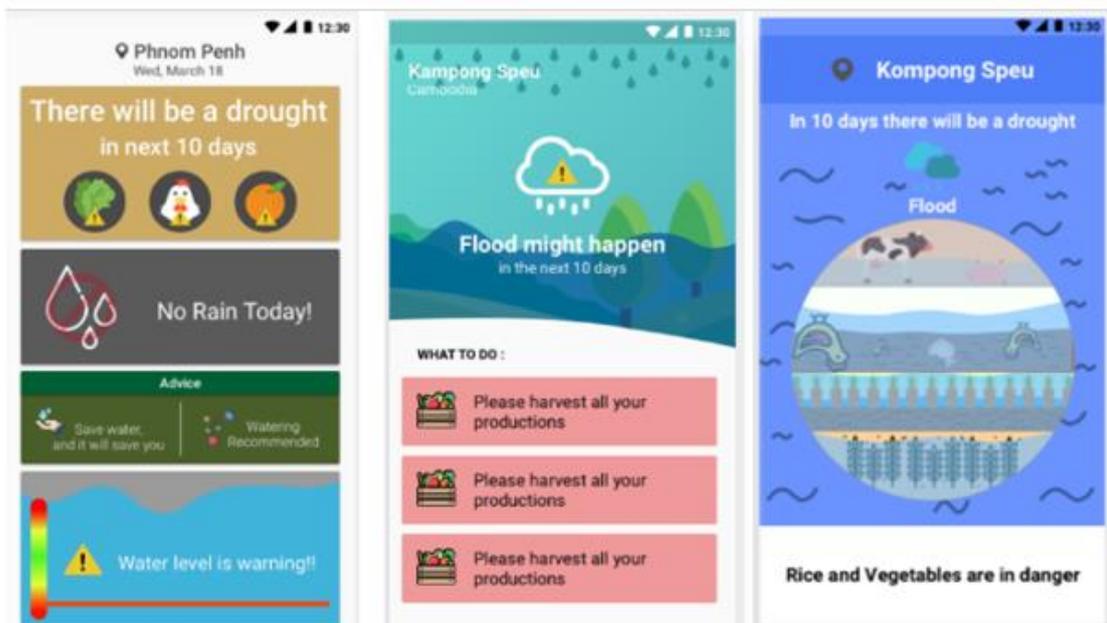
Examples of the various functions of the Smart Farmer App from the development phases

2. **Phase two** involved early stages of product development, testing various ideas and concepts.
3. **Phase three** involved a formal prototype testing whereby farmers participated in focused grouped discussions; testing the navigation and their understanding of the messaging in *Smart Farmer*.

Khum Kaheang

Task 1:
Task 2:
Task 3:
Task 4:
Task 5:

Feedback : Usefulness:

- Had many problems because she has never used a smartphone before.
- Could still complete all the tasks
- Thinks it can useful for the farmers and for her

Iterative stages of product development ensure the right farmers are targeted to use the app, relevant advice is given, and the app interface is easily navigable.

Reaching our vision

The AGILE Project aims to have 500 uploaders of *Smart Farmer* from different stakeholders within the agricultural sector within the initial project period, and then scaling from there: farmers (within producer groups and farming cooperatives), academia and local NGO partners. DCA Cambodia plans to support the launch and dissemination of *Smart Farmer* through various information campaigns and broadcastings through local radio.
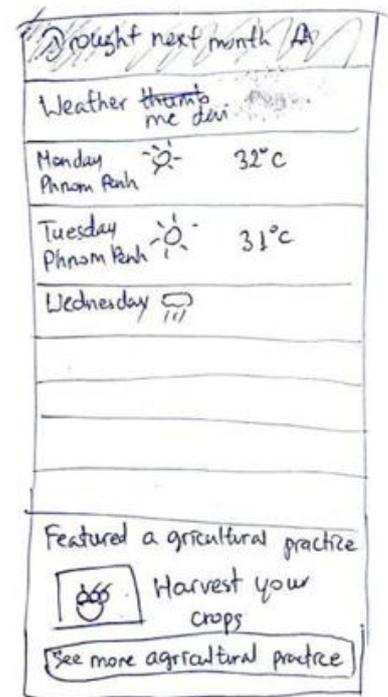
Where to from here?

There are a few components of the AGILE project which can be brought to scale: not only to more farmers in more regions of Cambodia but used as a template for innovation design in other country programmes. As Nash Modin, AGILE Project lead, says - **"digital resiliency development is scalable"**.

The algorithms used for processing the weather information into recommendations can be shared and used in other settings, regionally and with other NGOs. In Cambodia, Modin sees potential collaborating with the United Nations Development Programme (UNDP) who also own a local weather station and are interested to see the potential for information sharing.

Phase two: concept development

DCA Cambodia and HQ are linking with the *European Centre for Medium-Range Weather Forecasts* and Cambodian Government to explore the potential for more advanced weather predictions (up to 3 months) and supporting Government in declaring medium-term weather events. DCA is exploring ways to engage local cooperatives to further the development, maintenance and promotion of the app to ensure longer term sustainability and reach a wider audience in Cambodia.

The *Smart Farmer* app expects to be publicly launched in November 2018.

European Union Humanitarian
Aid & Civil Protection

DCA
actalliance