DATA DRIVE

IBM seeds tech to help farmers weather challenges

Through The Weather Company, Big Blue is helping farmers manage crops

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It is one of the most limiting factors in the agriculture industry — the unpredictable nature of weather. Frequent droughts, patchy unseasonal rain and vagaries of nature pose big challenges for farmers.

But technology is coming to the rescue. IBM Research-India is combining multiple, global satellite-based information sources to generate agronomic-specific insight to help farmers. It is developing prediction models using data and artificial intelligence to help farmers improve crop yield and productivity.

Commenting on what sparked the company's work in agriculture, Sriram Raghavan, Vice-President, IBM Research - India & Singapore, says though agriculture is a trillion-dollar industry, it faces significant headwinds like climate change, population growth and food security.

Add in other uncertainties like regional weather events, rapid shifts in market demand, and swinging crop prices, and a clearer picture emerges as to why agricultural players are looking to technology to protect and improve crop yields.

"We have a suite of services and combine multiple sources of satellite data and geospatial temporal data. Using public data from various satellites, from the US, NASA, as well as European states, we can get fine-grained information using AI," Raghavan says.

The data so generated can even help predict soil moisture. "Just as health of the crop is important, so is access to water. We combine information from multiple satellites to present a highly accurate picture," says Raghavan, also the CTO of IBM India.

Riding on data

The Weather Company assets that IBM acquired in 2015 provide access to terabytes of highly detailed, regularly updated, global satellite data. "Since we own The Weather Company, we can accurately predict high risk of pest and disease attack almost 14 days in advance," asserts Raghavan.

Farmers can now tap remote sensing data and cognitive analytics to get predictions on the right time to manage scarce groundwater-based irrigation, optimise timing and amount of fertilisers, as well as when to harvest to maximise produce and minimise wastage.

The company is fusing remote sensed data with locally sensed internet of things (IoT) data, like soil moisture sensors, and local weather stations to get even more precise insights. The IBM Watson IoT platform collects and curates data from multiple sensors, while the Watson Decision platform for agriculture collates weather data and analytics on a field-by-field or zone-by-zone basis, helping farmers maximise food production.

For many years, the IBM Research division worked on large-scale curation and processing of satellite images. Pairing it with a platform that IBM Research built, called IBM Pairs Geoscope platform, the company is now aggregating and analysing geospatial-temporal data like maps, satellite, weather, drones and IoT, using machine learning and advanced analytics.

Partnering start-ups

The Weather Company and IBM Research India have teamed up with agri start-ups such as AgroStar to pool data and create solutions. AgroStar, for instance, has a large database of farmer profiles and information on crops sown, land size, land type and so on, which are combined with The Weather Company's disease and pest forecast algorithms. The collaboration thus helps farmers do effective crop management.

With AgroStar, IBM works with farmers in Gujarat and Maharashtra. Terming it a good symbiotic relationship, the CTO says AgroStar's end-user facing mobile app "works like an Amazon for farmers. However, curation of satellite data is a heavyweight task. We are the back-end platform and bring the best of digital technology, whereas the mobile app provides an e-commerce-style capability."

The tech major is also partnering with RML Ag Tech, recently renamed FarmBee, which develops apps in seven Indian languages: Hindi, Marathi, Gujarati, Kannada, Tamil, Telugu and Bangla.

Stating that their app, which provides agriculture support solutions on mobile to farmers, is widely used in the farming community, Raghavan says RML relies on high quality and accurate weather data as a parameter to make its advisory relevant to client needs.

RML Farmer has seen 1.2 million downloads, serving 4 million farmers, so far, and currently has a subscriber base of 4 million.

IBM also works with AgRisk, a dedicated modelling and analytics company in the Indian agriculture domain. The latter has chosen to use forecast technology from The Weather Company to predict pricing trends in the 10-day commodity market and manage demand-and-supply fluctuations for local environments in India's intermediate districts and towns.

Mouse in the field Farmers are looking to technology to protect and improve crop yields ISTOCK