Use of predictive analytics in agriculture

Introduction:

Typically, farmers in India use age-old methods to predict the right sowing date for their crops. While these methods had worked well in the past, the changing weather patterns in the past decade have led to unpredictable monsoons, causing poor crop yields. This impacted farmers' incomes and increased their vulnerabilities, causing many to commit suicides as they could not repay their loans on time.

Intervention:

Microsoft partnered with International Crops Research Institute for Semi-Arid Tropics (ICRISAT) and Andhra Pradesh government to develop the Sowing App, a mobile application that uses predictive analytics to advise Indian farmers on the best time to sow crops, depending on weather conditions, soil, and other key indicators. The app aims to reduce failures and increase yield by arming farmers with information helpful in making critical decisions.

To calculate the crop-sowing period, historic climate data spanning over 30 years, from 1986 to 2015 in Andhra Pradesh was analyzed using AI. To determine the optimal sowing period, the Moisture Adequacy Index (MAI) was calculated. MAI is the standardized measure used for assessing the degree of adequacy of rainfall and soil moisture to meet the potential water requirement of crops. The real-time MAI is calculated from the daily rainfall recorded and reported by the Andhra Pradesh State Development Planning Society. The future MAI is calculated from weather forecasting models for the area provided by USA-based aWhere Inc. This data is then downscaled to build predictability, and guide farmers to pick the ideal sowing week.

Sowing advisories are then initiated and disseminated until the harvesting is complete. The advisories contain essential information including the optimal sowing date, soil test based fertilizer application, farm yard manure application, seed treatment, optimum sowing depth, and more. In tandem with the app, a personalized village advisory dashboard provides important insights into soil health, recommended fertilizer, and seven-day weather forecasts.

Impact:

In 2017, the program touched more than 3,000 farmers across the states of Andhra Pradesh and Karnataka during the Kharif crop cycle (rainy season) for a host of crops including groundnut, ragi, maize, rice and cotton, among others. The increase in yield ranged from 10% to 30% across crops.

Source: FAO, Climate-Smart agriculture Case Studies 2018: Successful approaches from different regions