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How RMSI Cropalytics Leverages AI To Predict Crop Yield

25/05/2021

→ RMSI Cropalytics has analysed crop yields across 700 rural farming districts in India and mapped 180 million hectares.

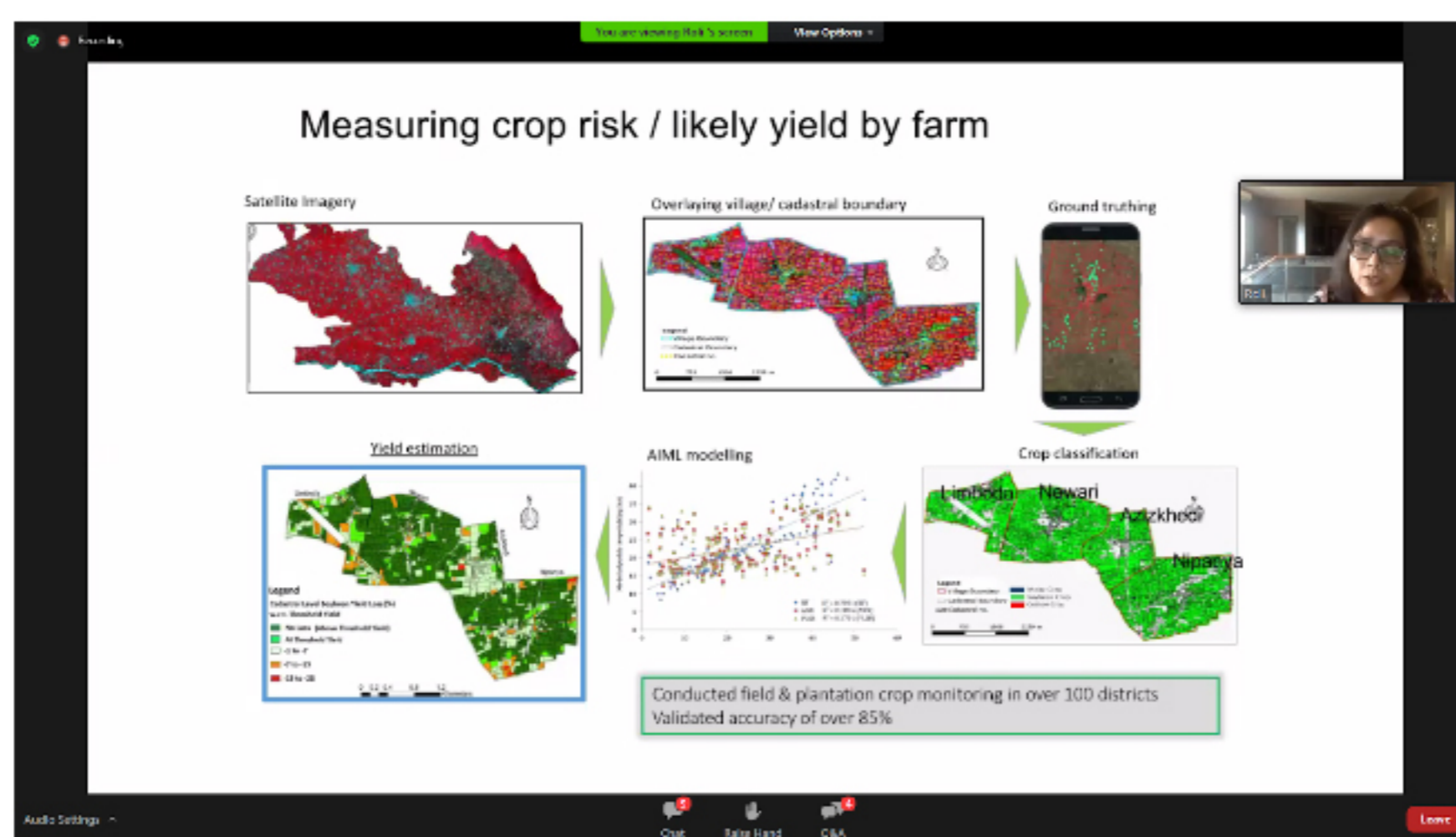
India has a diverse agricultural landscape with a land area of 159.7 million hectares. Soil fertility, crop yields and irrigation methods vary from one region to another. This diversity, along with excessive dependence on monsoons, small farm sizes, and broken supply chains, has made crop yield prediction extremely difficult.

This is where technology can play a huge role, believes Roli Jindal, Co-Founder, RMSI Cropalytics.

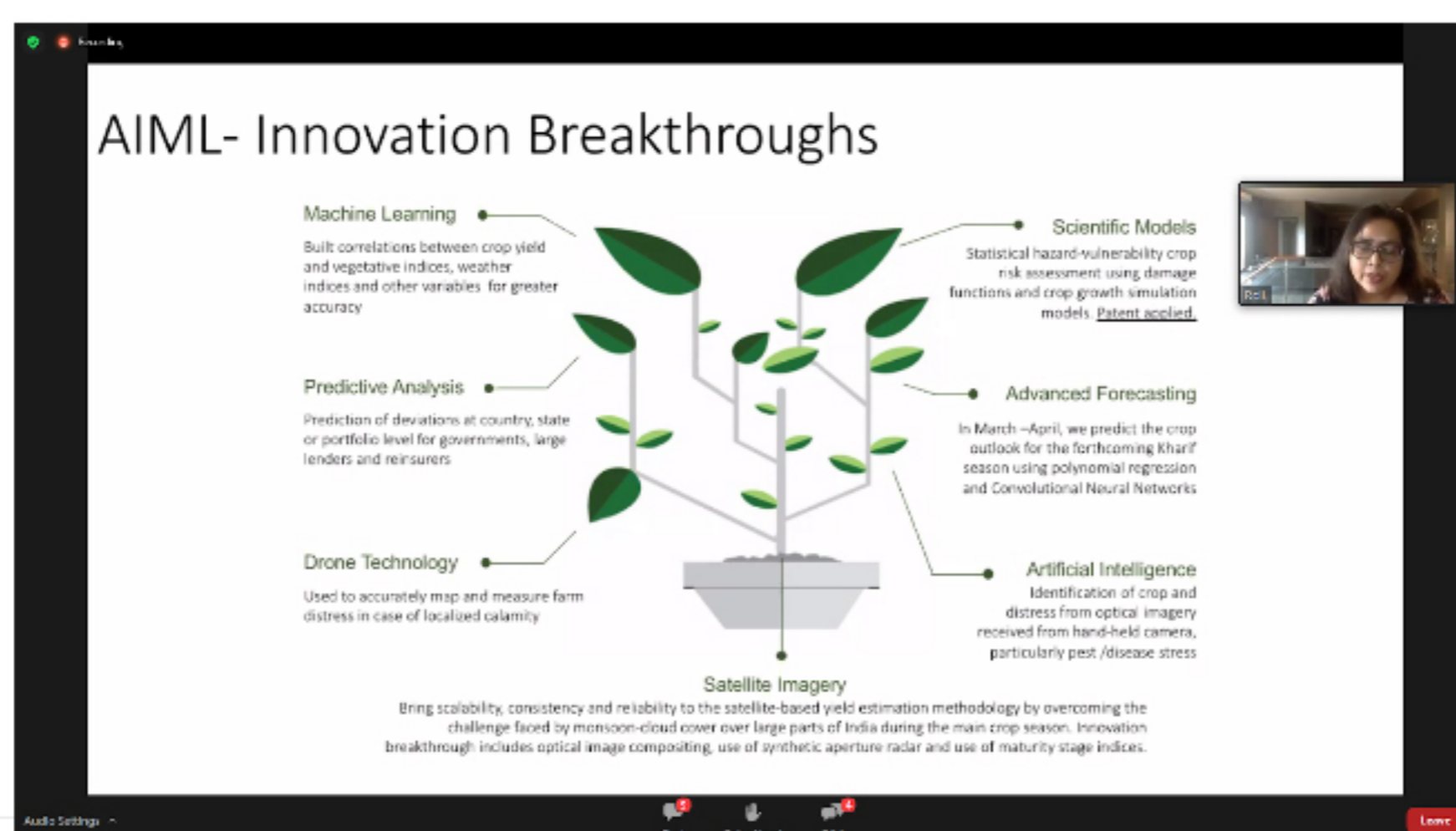
Speaking at The Rising 2021, an annual event organised by Analytics India Magazine that celebrates women in data science, IT, industry and academia, Jindal explained how startups like RMSI Cropalytics combine advanced modelling, ML, crop and meteorological domain expertise to provide solutions to decision-makers in government, crop insurance, banking sector, agricultural input and social sector, among others.

She spoke about how experts can train the machines to look at satellite imagery, identify the crop and predict the crop yield. “This is scalable, across millions of farms in multiple districts of India benefitting the government and agri-inputs companies,” she said.

RMSI Cropalytics has analysed crop yields across 700 rural farming districts in India and mapped 180 million hectares.



Right now, the government’s sample size to estimate yield in each district is too small. “As you can better understand, this is not very accurate, does not take into account the tremendous variability in farm to farm yield and takes a very long time to compile,” she said.



“We derive indices out of every pixel on the satellite image and then build correlations between crop field and these indices. And then we train the machine to pick up the indices from the different pixels, millions of pixels across the landscape. And to make an assessment of what the input is going to be in that farm,” said Jindal. Using this methodology, the startup is able to predict and estimate a crop yield by the farm or by village or by district, even as the crop is still standing in the field.

Over a period of time, the company has learned to use soil moisture data derived from synthetic aperture radar imagery to derive greater accuracy in yield estimation. “We have also developed a polynomial regression and convolutional neural network-based approach to forecast crop outlook for the yield season as early as March. We have also built hazard vulnerability-based assessment using damage functions that correlate crop risk to rainfall,” she said.

In India, land records are maintained in regional languages. The startup has developed an NLP model to transliterate all data to English. “Again, AI is used to join the English databases to the local language database. This has already been achieved for Marathi, Telugu, Oriya, Bengali and Tamil,” she said.

The startup collects large-scale, high-resolution satellite data and then applies artificial intelligence to it. But, how accurate is this process? “This is an emerging science, when it started, even two to three years ago, the accuracy used to be around 70 to 75% on yield estimation. Today, crop classification accuracies have now gone upwards of 95% and crop yield estimation accuracies have gone upwards of 85%,” Jindal said.