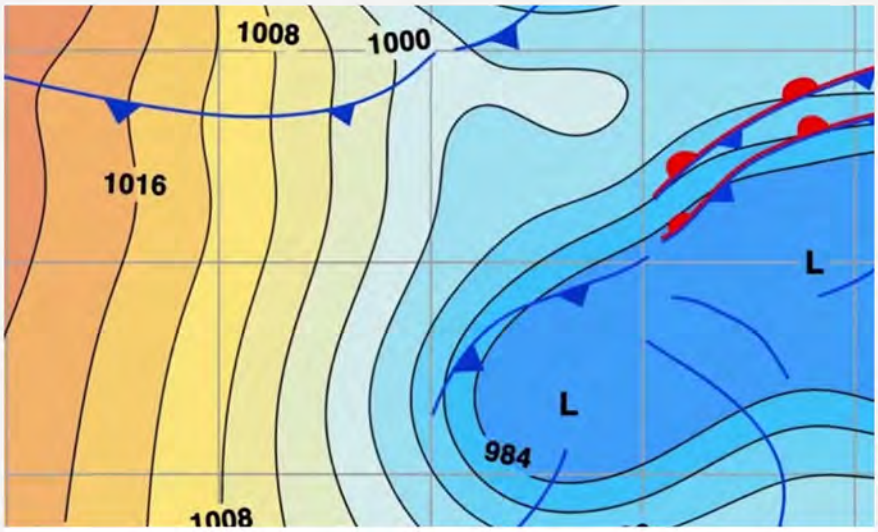

EDITOR'S PICK

RMSI Cropalytics: One of our major achievements is being selected by the Ministry of Agriculture to execute satellite imagery-based crop yield estimation

Steena Joy

RMSI Cropalytics is a subsidiary of RMSI, a global leader in geospatial and engineering solutions. These solutions address global issues of climate change, natural calamities, human habitation, food security, autonomous transportation, smart utilities and networks. In an exclusive interaction with The Organic Magazine, **Roli Jindal**, Co-founder, RMSI Cropalytics and **Pushpendra Johari,** Director, RMSI Cropalytics share their insights on how technology can help the farming community in India and the government's role in making it accessible to farmers.

Roli Jindal

Pushpendra Johari

What was the vision behind setting up RMSI Cropalytics?

Roli Jindal: RMSI Cropalytics was formed to address the emerging needs arising from the rapid growth of institutional financing of the agriculture sector through crop loans and crop risk financing (insurance), which requires comprehensive and well-organised data and analytics.

Headquartered in Noida (India), the company has its operations spread across all states. We combine advanced modeling, machine learning, and crop and meteorological domain expertise to provide solutions to decision-makers in government, crop insurance, agriculture input sector, banking, commodity trading and social sector.

Pushpendra Johari:.RMSI Cropalytics has grown remarkably since its inception in 2019. One of our major achievements is being selected by the Ministry of Agriculture and Farmers & Welfare (the Government of India) to execute satellite imagery-based crop yield estimation. The company has a team of multi-disciplinary professionals including meteorologists and agriculture scientists. We have also executed satellite-based crop health tracking and yield estimation for several districts in India. Our user-friendly platform forecasts crop-wise yields and productions for both the cropping seasons for more than 700 districts.

How can technology help the farming community in getting better returns? Your insights on Big Data and AI in agriculture? Especially in organic farming?

Roli: After the launch of Pradhan Mantri Fasal Bima Yojana (PMFBY) in 2016 and the revamped Restructured Weather based Crop Insurance Scheme (RWBCIS), India has become one of the largest crop insurance markets in the world with annual premium collections in the range of Rs 35,000 – 40,000 crore.

The Ministry of Agriculture implements the complex program in 27 States/UTs. This includes the involvement of multiple stakeholders from the enrolment of farmers to claim disbursement to farmers. These are Farmers, Central/State Government, Insurance Companies, Reinsurers, Banks, Insurance Sales Intermediaries such as Common Service Centre (CSC) as well as allied inputs such as weather data providers, and crop-yield estimators.

There are vast datasets in different silos – insurance policy database, land records, cadastral maps, historical yields, historical weather data, farmer claims, and current season field progress as viewed from the satellites. If all of these datasets are made to interact with each other, then the scheme implementation can be greatly streamlined and made more scientific and objective. Transparency will also benefit the distressed farmers.

For example, by using the existing big databases, we will be able to identify pockets of agri-distress in near real-time for all stakeholders to address the distressed farmers on priority. This includes organic farmers who are particularly susceptible to pest and disease attacks.

Pushpendra: The three primary categories of technology that can help farmers are:

- Farm-based Technology including farm mechanisation, modern irrigation (like drip) and IoT based solutions
- Modeling-based Technology including statistical, numerical, and machine learning-based models to forecast information that can improve production
- Smart Agri Value Chains to maximise efficiency and increase returns for the value chain actors

These technologies are crucial from the Organic Farming perspective as crops are more susceptible to the impacts of weather as well as pest and diseases, and perish faster.

What solutions does the company offer?

Roli and Pushpendra: RMSI Cropalytics helps decision-makers in government, crop insurance, agriculture input sector, banking, commodity trading and social sector. The key products and solutions have been curated to address the technological requirements in the agriculture sector:

- Policy Verification: This is a part of our technology-based solution PInCER (Profiler for Insured Crop Exposure and Risk) that helps insurance companies
- in verifying hundreds of thousands of crop insurance policies.
- Crop Season Tracking: Using satellite imagery, we estimate sown acreage, crop health and likely yield. This helps insurance companies to project likely claim payouts, agri-input companies to plan stock availability and agri-traders to estimate commodity supply.
- Seasonal Outlook: We have created an online portal from which users can readily download district-wise, crop-wise outlook reports for the upcoming season for more than 700 Indian districts.
- Portfolio Analysis: Based on extensive yield and hazard databases, our solution PInCER has developed a sophisticated probabilistic and stochastic model to calculate portfolio risk to help reinsurance companies arrive at term- sheets for their cedants.
- Crop Insurance Premium Calculator: This is an efficient tool for new entrants into the crop insurance business. It helps them arrive at 'burn cost' as stipulated by the PMFBY guidelines and probability-based premium cost for different covers using hazard databases.
- Digital Agri Market Place: Through this platform, the entire value chain operations along with the financial transactions can be performed. The feature can also help the government in pushing new policies effectively.

Any case studies that we can refer to?

Pushpendra: In a short time, RMSI Cropalytics has:

- Created a comprehensive platform for crop insurance management for insurers and reinsurers, including real-time insured crop portfolio risk assessment and tracking.
- Been selected by the Ministry of Agriculture, Government of India to carry out satellite imagery-based yield estimation
- Been trusted by several large crop insurance companies to verify their insurance portfolio
- Carried out satellite-based crop health tracking and yield estimation for several districts in India
- Developed a platform that forecasts crop-wise yields and productions for the forthcoming crop season for more than 700 districts.

The accuracy level of our satellite-based yield estimation technology is quite high when compared with actual yield measurement on the ground. Several case studies across seasons and multiple districts of India in Madhya Pradesh, Chhattisgarh, Jharkhand, Andhra Pradesh, Odisha, Maharashtra and other states are available. We have also successfully implemented the digital agriculture market place in Malawi and several crop advisories to numerous countries in Africa.

There is a lot of talk on using GPS and drones for crop monitoring and pest management?

Roli: Yes, because these technologies have become essential to provide us with real-time data that has high-level of accuracy and quality. GPS is used for geo-tagging a field so that it can be remotely monitored. Advance warning in the form of advisory can be issued to the farmers about the upcoming weather. Besides, pest outbreak can be accurately mapped and timely information can be disseminated for necessary and immediate action. Similarly, drones help in tracking a localised area particularly during cloud cover when it gets difficult to get clear optical satellite imagery.

Pushpendra: However, the use of drones isn't scalable in larger areas due to logistical problems and flying approval requirements.

Tell us about PInCER crop insurance management? In India farmers are very new to or cannot afford crop insurance so what is the company's strategy to find acceptance to PInCER?

Pushpendra: I would like to add that affordability is not a problem in case of crop insurance because the government subsidises a heavy premium amount. Hence, if the farmers are informed about the scheme, the chances of opting it are higher.

PInCER (Profiler for Insured Crop Exposure and Risk) is a comprehensive Crop Insurance Management platform that provides the government, crop lenders and insurers with information and analytics required to set up and manage consistent and efficient operations in the agriculture sector. This breakthrough solution applies innovative approaches to premium pricing, claims settlement and planning a reinsurance strategy. The various PInCER modules have been designed for all the stakeholders who support farmers in overcoming the agri distress.

How does Indian agriculture compare to its global counterpart in terms of automation/technology?

Roli: In India, farm sizes are quite small and mechanisation is less prevalent. Internationally, the scenario is similar in several African and Asian countries. The US, however, has very large farms, and agricultural practices are quite mechanised and amenable to technology. The large size of farms makes satellite-based mapping easier and enhances the monitoring and tracking of farming practices.

In India, for a long time, the monsoon cloud cover during the main cropping season (Kharif) made satellite-based tracking difficult. Now, RMSI Cropalytics has created innovative solutions to carry out satellite-based monitoring, tracking and yield estimation in the Kharif season as well.

We are carrying out gram panchayat level yield estimation for the Government of India using technology such as satellite imagery, drones, photo-interpretation using Artificial Intelligence, and Machine Learning in several districts in various states in India.

The government's role in making technology accessible and affordable for the Indian farmer?

Pushpendra: We have been fortunate to be selected by the Ministry of Agriculture and Farmers' Welfare (Government of India) for various projects benefitting the agriculture sector. The decision makers in the government are using innovative technologies to formulate and implement effective policies. We have helped the government in developing the methodology for technology- based crop yield estimation on a large scale and conducting actual yield estimation at Gram Panchayat level for several districts.

Future plans for RMSI Cropalytics?

Roli & Pushpendra: We design our services to ensure better utilisation of funds for the social sector. At the moment, our team is designing a program for donors, foundations and social sector organisations. This shall help in identifying distressed farmers and agrarian distress hotspots. Besides, we are helping farm lending agencies to map a loanee farmer's risk score at farm level, monitoring crop yield and providing banks /NBFC's with an assessment of repaying capacity in an advance.