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SMART AGRI POST

Agri sector reforms face setback as govt relents to protests

Tech & satellites; agents of change in agri sector

Meet automobile engineer who has graduated into successful agripreneur!

India breaks into 10 top agri export nations with record shipments

Tech & satellites; agents of change in agri sector

The use of technology has gone far beyond the realms of scientific institutes, service sectors and medicine. Technology and tech startups are rewriting a new chapter in the agriculture sector with discernible farmer awareness and helping to raise farm yield. This article takes a deep dive into these aspects while making a strong pitch for sustained government support.

With the convergence of digital factors, agriculture offers an exciting opportunity for innovation.

Agriculture in India is a USD 400 billion sector and contributes 17 per cent to India's GDP. However, the sector faces major challenges in way of organized and scattered data.

With the convergence of digital factors, agriculture offers an exciting opportunity for innovation as market players can leverage next-generation technologies such as data digitization and data platforms, data analytics, AI, ML, the IoT, and Software as a Service (SaaS) to disrupt existing practices. Technologies such as remote sensors, satellite imagery, drones, weather stations, and mobile platforms have given agri-stakeholders unprecedented access to data that enables good decisions and help provide farmers with decision-making support systems by predicting environmental pressures, estimating yield, forecasting weather conditions, guiding precision farming and anticipating pest vulnerability.

Real-time data drives the precise application of resources. Additionally,the digitalization of farms allows for quick, easy analysis of crop management and protection. Expansion of segments such as crop finance and crop insurance that have now become major sources of revenue for financial institutions has resulted in increased demand for accurate agri-data. This is where digitization plays an important role. Various innovative tools

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are being used to combine real-time farm-leveldata and macro data to provide advisories/inputs/alerts to farmers, decision-makers about managing their farms, crop mix and yield.

Boom in Agri-tech startups

Leading technology companies are associating with the Indian Government and state-sponsored research entities to implement AI in agriculture. Product technology companies and service providers have started emphasizing Agri-tech as a segment and offering various solutions to solve agribusiness challenges. Technology companies -making have been forging associations with agribusiness enterprises to articulate intelligent solutions for farms. Technology companies are working to create a vigorous AI agriculture ecosystem by investing in research programs and creating an incubator for start-ups. Developing industry dynamics and strong government support have resulted in the growth of a whole new segment of Agritech start-ups that are not only solving specific business problems for crop farming but also livestock and aquaculture segments across the value chain.

Indian agriculture to global counterpart in terms of automation/technology

In India, farm sizes are quite small and mechanization 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. Addressing this gap, RMSI Cropalytics has created innovative solutions to carry out satellite-based monitoring, tracking and yield estimation in the Kharif season also. RMSI Cropalytics is 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.

Selecting the right technologies to address specific agri-challenges

With agri-tech being a high-interest area, multiple agri-startups have come up in the ecosystem with innovative technologies. Different agri-tech companies today are specializing in data collection technologies but they are pushing their tech solutions for each agri-challenge regardless of the real requirement. But it is imperative to assess, what is more, suited where.

For example, for loss assessment in a particular area in case ofa localized calamity, the use of drones may be a good option. Similarly, IoT may be well suited for precision farming of crops such as strawberries and grapes where parameters such as farm-specific humidity and soil moisture need to be tracked daily. Satellite-based imagery offers the widest and most cost-efficient coverage of a large country such as India for widely sown crops. RMSI Cropalytics uses all these technologies, as and when required. We have always taken the appropriateness, scalability and cost-efficiency of the yield estimation methodology as guiding principles.

RMSI Cropalytics' SAAS platform -PInCER combines high-resolution satellite imagery and measurements from synthetic aperture radar (SAR) with artificial intelligence (AI) and machine learning (ML) techniques, such as artificial neural networks and PLSR and advanced analytics, using our suite of thousands of damage function equations. They are based on our expertise in hazard vulnerability risk assessment to deliver a reliable, scalable and cost-efficient solution to this challenging project of crop yield estimation across the country every cropping season.

RMSI Cropalytics conducts farm and village level crop acreage, health and yield forecast using remote sensing, advanced modelling, artificial intelligence, and machine learning.

Implementing emerging technologies to enhance Indian Agriculture

The agriculture sector is plagued by problems like weather-dependent agriculture, inefficient supply chains, and resource degradation. By addressing the data challenge, digital solutions can assist in addressing the following challenges:

- Sowing and seed selection decisions are influenced largely by farmers' perceptions and experience, which may not always result in maximum yields
- Availability of quality seeds
- Lack of knowledge regarding specific agricultural inputs
- Pests and crop diseases destroy 30 per cent to 35 per cent of crop yields in India every year
- Lack of sufficient mechanization
- Insufficient irrigation infrastructure
- Reduced productivity due to frequent disease outbreaks in livestock
- Capital shortage among farmers
- Production losses due to spoilage/ waste range from 30-40%
- Lack of adequate storage facilities

AI-based solutions could include a seed scoring system to enable high throughput germination analysis, a digital algorithm that uses climate, soil, moisture, and rainfall data to suggest the best time for sowing for maximizing yield, an AI-enabled disease detection algorithm, along with recommendations on optimal pesticide usage and a pesticide administration protocol that uses AI to identify insects and sprays pesticides using drones.

"The idea behind these new areas of digital agriculture solutions is to improve agriculture value chains from farm to fork to improve farm productivity and generate profits for farmers. This calls for increased public-private partnerships and investments in IoT and AI solutions."

How can the Government help?

Government policies have provided increased support to farmers through the last few years and given a boost to the agritech sector.

Most importantly, the Government can play a crucial role in bringing together silos of data. There are vast datasets in different silos such as insurance policy databases, land records, cadastral maps, historical yields, historical weather data, farmer claims, and current season field progress as viewed from satellites. If all of these datasets are made to interact with each other, they will throw up fascinating insights and digital solutions can be implemented to benefit several sectors.

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Government initiatives to boost agriculture

The Government of India is already taking multiple initiatives for the benefit of agriculture. The government is serving small and marginal farmers to upgrade their access to farm machinery at affordable prices by providing training and financial assistance. Cloud-based infrastructure (AIRAWAT) is a platform to enable AI solution developers to train algorithms effectively, hosting large 'common goods' data sets. Cyber- Agro Physical System (CAPS) integrates the data from sensors with computers, satellite imaginary, supercomputing facility for research, and AI-enabled farmers' advisory services. It is a one-stop solution for all the information needs of farms and acts as centralized knowledge storage of timely advisory services on various topics such as Kisan Suvidha, PusaKrishi, Crop insurance and Agri market- Participatory guarantee system of India (PGS) portal.

Areas where RMSI Cropalytics is

pitching in

RMSI Cropalytics conducts farm and village level crop acreage, health and yield forecast & estimation using remote sensing, advanced modelling, artificial intelligence, and machine learning. This, combined with other datasets supports timely distress mitigation, village prioritization for better prospecting, farmer credit rating, better portfolio risk management for lenders & insurers, early insurance claim settlement, high-resolution crop monitoring, efficient communication with farmers and early claim settlement.

“Our satellite technology-based yield estimation can significantly help in quick response to agrarian distress through effective identification of distress at a higher resolution in near real-time”

In our journey since 2019, we have been able to code 6,50,000 village boundaries, map 180+ million farming hectares in the country, digitize 170+ million farm ownership records and analyze data for 20+ major Indian crops to develop crop models.

“Our mission is to enable benefits for truly distressed farmers and be a one-stop destination for detailed analytics on Indian agriculture”

RMSI Cropalytics’ data can be accessed using its SaaS platform PinCER™ which provides village prioritization tools, precision farming solutions, in-season tracking and yield estimation and estimation of crop risk profile reports for the country.We have been selected by the Government of India to carry out crop acreage, yield estimation, crop health monitoring. For the private insurance sector, we have verified hundreds of thousands of insurance policies against land records along with tracking crop health and estimating likely yield /risk at the gram panchayat level. We help commodity traders and agri-input companies prioritize villages for procurement and sales.

Conclusion:

Deep Tech Agri Tech companies such as RMSI are making efficient and effective interventions to solve many different problems in Indian agriculture. Effective AI algorithms require good, extensive and sustained data supply, and it is here that the government can truly play the role of facilitator.