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IoT and AI to reinvent Indian agriculture

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Emergence & growth of agritech in India

Over the last decade, the Indian agri ecosystem has gone through a rapid transformation made possible due to the advent of agritech segment, by creating investment opportunities and increasing production and logistics efficiencies. Advances in agritech are hugely relevant to India's economy today. The agriculture sector, which is worth US$ 370 billion*, continues to remain the primary source of livelihood for more than 40* percent of the population while contributing 19.9* percent (FY 2021) to the national GDP. Agritech segment in particular has attracted a surge of startups that are offering technology-based solutions thereby allowing large-scale traditional enterprises to focus on increasing operational efficiencies.

Surge in agritech funding

As on March 2022, according to industry estimates, India is said to have more than 1000 agriculture startups (agritech) employing artificial intelligence (AI), machine learning (ML), internet of things (IoT), etc. India has received a total funding of US$ 1.6 billion in agritech startups till 2021+, making it the third largest country in the world with regard to agritech funding. Confederation of Indian Industry (CII) in collaboration with Bain & Company jointly produced another report in March 2022 which indicates that private equity (PE) investments are primarily focused on systemic issues in agritech industry and its sustainable development. Private equity investments in agritech startups between 2017 and 2020 amounted to INR 66 billion, with a growth rate of over 50 percent.

While the Covid-19 pandemic hampered business dynamics across industries, the agriculture sector remained largely unaffected, rather putting them on an upwards growth trajectory. The consistently growing demand for food has further improved the potential for expanding market reach for farmers and agribusinesses in the country.

Reforms and government initiatives

Both central and state governments are working in tandem to promote agritech in the country. The Digital India initiative has helped the rural economy connect globally. Various reform initiatives have been launched to boost farm revenue in the country. Prominent are National Agriculture Market (eNAM – a pan-India electronic trading platform); India Digital Ecosystem of Agriculture (IDEA – an Agristack system for growing farmer income); National Mission for Sustainable Agriculture (NMSA – aimed at increasing Agri output by integrating sustainable technologies) and National e-Governance Plan in Agriculture (NeGP A – for funding modern technologies including AI, ML, drones and Blockchain).

Agritech business models

Driven by increasing internet penetration in rural India, India stands at the forefront of changing methodologies in agriculture while transitioning from conventional business models to various innovative business models driven by agritech. Emerging business models across the agriculture value chain can be broadly classified into the following three categories.

- Margin based: Players create market linkage on inputs or output side, earn margins on buy or sell side

- Subscription based: Players offering a mix of hardware, software, and services to help farmers improve crop yield, and track the quality of produce while tracing the produce across the value chain

- Transaction based: Players charge on number of transactions served such as a loan and insurance policies

Broad categories of agritech applications in India

Application of AI, ML, IoT and Blockchain in Indian agriculture may be classified into three broad categories:

- Crop & soil health monitoring: Businesses that are leveraging sensors and various IoT based technologies to monitor crop and soil health

- Predictive analytics: Several AI and machine learning tools that are used to predict the optimal time to sow seeds, get alerts on risks from pest attacks, and the likes

- Supply chain efficiencies: Businesses that are using real-time data analytics from multiple sources to build an efficient and smart supply chain

Smart application for better monitoring

The use of smart applications in agriculture helps in the better utilisation of resources. With the use of applications like "AgriReach", we can easily check the quality and quantity of the crops and enable Digital Professional Warehouse Management Solution with Instant, Transparent, and Auditable Agri Quality as well as Supply Chain Reports. In addition, data about crop health, including types and extents of disease manifestations, can also be tracked. A number of factors contribute to irrigation and fertilizer decisions. In this way, farmers can mitigate damage and subsequent costs in a timely manner.

In conclusion

Considering the impact of agritech and the tremendous growth potential of agriculture in India's overall economy so far, it has a huge potential to significantly improve the end user experience for farmers, consumers and enterprises. We are witnessing a huge surge in the emergence of agritech startups in India, driven by advanced technology penetration coupled with a conducive policy environment. This can only be seen as a starting point for penetration of advanced technologies like AI, ML, IoT & Blockchain in the Indian agriculture ecosystem. These collective technologies come as a great boon to the agricultural sector which is heavily reliant on unpredictable climatic conditions. More and more use cases of AI, ML, IoT & Blockchain in agriculture are likely to show up in the coming decades due to their immense value addition.

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