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AgriTech Startups & Rise of Technology in Indian Agriculture

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Introduction

India's agritech sector shows tremendous potential and widens its global footprint. Despite the progress, it is still in its infancy and has reached 1% of its possible market capacity.

India's agriculture sector plays a pivotal role in its economy. Contributing 18.3 percent to the gross domestic product (GDP) and providing employment to 158 million people in 2022-23, agriculture is not merely an economic endeavor but a livelihood and way of life for millions across the country. Agripreneurs are confident that Indian agriculture will undergo a major transformation in the next decade, with a strong shift towards sustainable practices such as bio-based solutions and technological advancements like artificial intelligence, IoT, drones, and more. As per statistics from the Food and Agriculture Organization (FAO) of the United Nations, India is the leading global producer of milk, jute, and pulses, while ranking second in the production of rice, wheat, sugarcane, cotton, groundnuts, and fruits and vegetables.

The government's drive for agritech

Agritech refers to a network of enterprises, startups, and solutions that harness technological innovations to provide products and services to enhance crop yields, drive efficiencies, and ultimately increase profitability for farmers throughout the agricultural value chain. India currently hosts more than 3,000 agritech startups, with over 1,300 leveraging emerging and disruptive technologies (EDTs) like artificial intelligence (AI), machine learning, and the Internet of Things (IoT) to enhance agricultural operations. According to the report Transformation of India's Agriculture, released by the Federation of All India Farmer Associations (FAIFA), the number of startups in agriculture and allied sectors has skyrocketed from 50 to 7,000 over the past nine years, due to a favorable business environment and strong government support. Schemes initiated by Govt. are as follows:

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- **Pradhan Mantri Fasal Bima Yojana (PMFBY):** Launched in 2016. It provides financial assistance to farmers to mitigate the impact of crop losses. The scheme covers various types of crops, including rabi and kharif crops, as well as annual horticultural and commercial crops.
- **Pradhan Mantri Krishi Sinchayee Yojana (PMKSY):** Under the scheme, an allocation of USD 7.64 billion has been earmarked for various initiatives to improve agricultural productivity and sustainability. This investment focuses on enhancing irrigation systems, expanding the cultivable area, and improving the efficiency of on-farm water management to reduce wastage.
- **Paramparagat Krishi Vikas Yojana (PKVY):** The scheme actively promotes organic farming practices and encourages a balanced use of chemical fertilizers to enhance soil health and sustainability.
- **Agricultural Technology Management Agency (ATMA):** Aimed at improving agricultural productivity and ensuring the sustainable development of agriculture through the effective management of agricultural technology.

Fig 1: Use of technology in Indian agriculture

Agri-startups - Laying the foundation for a sustainable agriculture revolution

Today, with the rise of the agritech sector, India is on the brink of a fourth revolution. It is crucial to emphasize that the nation's agritech ecosystem is transforming into a juggernaut. With the adoption of IoT-enabled agricultural methods and the introduction of AI-driven technologies, this burgeoning sector is shaping the next chapter of India's agricultural journey.

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The fourth agricultural revolution is approaching India and is set to revolutionize the global food supply chain.

In light of this, we have assembled a list of notable agritech startups in India, demonstrating the innovative progress they are achieving in transforming the agricultural sector:

Sl. No.	Agri startups	Founder	Year	Services
1	**Salam Kisan**	Dhanashri Mandhani	2022	It is an innovative agritech startup that provides various end-to-end services like drone-based soil testing, procurement, and marketplace offerings to farmers, combining technology with agricultural expertise to improve farming efficiency and productivity.
2	**Agrizy**	Vicky Dodani and Saket Chirania	2021	It is a B2B agri-processing platform that facilitates connections between agricultural processors and buyers dealing in non-perishable farm products across both food and non-food categories such as oilseeds, cereals, pulses, and jute.
3	**ONO**	Rama Rao Kancharapu	2021	strengthening the link between farmers and mandis through a range of services including ONO Connect, ONO

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				Cash, ONO Click, ONO Mandi.
4	**Otipy**	Varun Khurana and Prashant Jain	2020	The company uses a community-based approach to procure fresh produce from farmers and deliver it to consumers through a network of community leaders, primarily local resellers.
5	**Vegrow**	Praneeth Kumar, Mrudhukar Batchu, Kiran Naik and Shobhit Jain	2020	It operates a B2B fruit marketplace. It offers farmers a range of tech solutions such as crop advisory, grading, packaging, logistics and sales support.
6	**BharatAgri**	Siddharth Dialani and Sai Gole	2017	The startup provides AI-based agronomy services that aim to help farmers achieve higher yields by offering data-driven insights and personalized recommendations.
7	**Jai Kisan**	Arjun Ahluwalia and Adriel Maniego	2017	It is a rural India-focused neo-bank that provides financial solutions tailored to the needs of rural communities, particularly farmers. The platform offers

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				quick and accessible credit solutions in both online and offline rural commerce environments.
8	**Intello Labs**	Milan Sharma, Nishant Mishra Himani Shah and Devendra Chandan	2016	A Gurugram-based startup that uses AI and image recognition tools for grading and quality checks of agricultural products is likely focused on leveraging cutting-edge technology to improve the efficiency and accuracy of the quality assessment process in agriculture.
9	**BigHaat**	Raj Kancham, Sachin Nandwana, Sateesh Nukala.	2015	BigHaat is a farmer-centric digital marketplace, that delivers technical guidance and accessibility to a wide range of high-quality agricultural inputs such as seeds, fertilizers, pesticides, and farm equipment.
10	**Ninjacart**	Nagarajan, Sharath Loganathan, Sachin Jose, Kartheeswaran KK and	2015	Bengaluru-based startup focused on streamlining the supply chain by sourcing produce directly from farmers and delivering

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		Vasudevan Chinnathambi		it to retailers like supermarkets.
11	**Agrostar**	Shardul Sheth and Sitanshu Sheth	2013	It provides farmers with agriculture solutions through both a mobile app and an interactive voice response (IVR) system.
12	**DeHaat**	Shashank Kumar	2012	It is an agritech startup that provides end-to-end agricultural services to farmers, offering a comprehensive range of support to enhance their farming operations.

Strategic Areas for Agri-tech Startups

1. **Big data**- Startups in the agritech sector increasingly leverage drones and tractor-based solutions to collect real-time data from fields, focusing on weather and agricultural factors to help farmers manage risk more effectively.

   eg: Agrostar and RML Agtech, two leading agritech companies, are investing INR 5 crore ($776,000) each to develop image recognition technology that will help farmers to diagnose pests and diseases in real-time. This groundbreaking technology will allow farmers to take immediate action, potentially saving crops and improving yields by addressing problems at the earliest possible stage.
2. **Farming-As-A-Service (FAAS):** Agri equipment renting is rapidly emerging as a solution for farmers who need access to modern machinery but cannot afford the high upfront costs of purchasing it. eg: EM3 AgriServices is a leading agritech company in India that provides farming services and machinery rentals to farmers on a pay-per-use basis.

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3. **Market Linkage Models:** Innovations aimed at helping farmers with timely and accurate estimation of sowing and harvesting, in sync with consumer demand patterns, are becoming increasingly important in modern agriculture.

   eg: MeraKisan.com is an innovative online platform that connects consumers in India with local farmers, enabling them to order fresh food and goods directly.

4. **Fintech for farmers:** By implementing payment gateways linked to farmers' accounts, these startups can enhance financial inclusion, improve transaction efficiency, and facilitate better financial management for farmers.

5. **IOT for farmers: Smart farming** transforms the agricultural business by integrating advanced technologies and data-driven practices to enhance efficiency, productivity, and sustainability. Information on crop yields, rainfall patterns, pest infestation, and soil nutrition can be used to improve farming techniques over time.

   eg: Stellapps is a pioneering agritech startup that utilizes cutting-edge technologies such as cloud computing, data analytics, and wearables to enhance various aspects of the agricultural supply chain, particularly in the dairy sector.

Hands-on mushroom cultivation

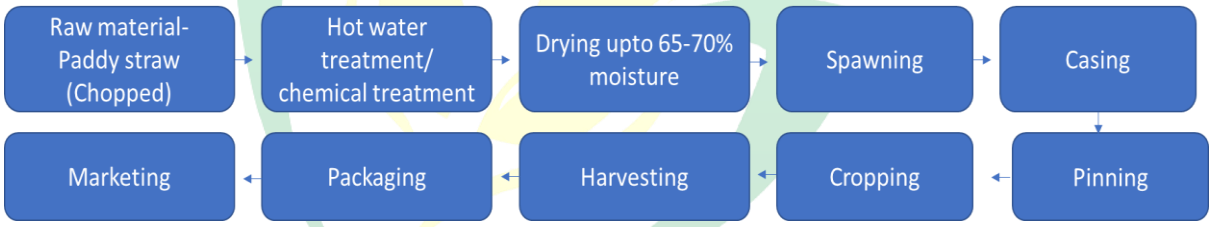

Fig. 2 2: Mushroom cultivation- Raw material management to cropping

Conclusion

Agritech startups are at the forefront of transforming the agricultural sector, addressing critical challenges faced by farmers and the broader food supply chain. By leveraging innovative technologies such as data analytics, IoT, automation, and sustainable practices,

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these startups are enhancing productivity, reducing waste, and promoting environmental sustainability. As they continue to develop solutions tailored to the unique needs of farmers, agritech startups are not only improving crop yields and quality but also empowering farmers with better market access and financial stability. The ongoing investment in research and development, coupled with supportive government initiatives, will further catalyze growth in this sector. As the global population continues to rise, the role of agritech startups will become increasingly vital in ensuring food security, sustainability, and resilience in agriculture. Embracing this innovation-driven approach will pave the way for a more efficient, productive, and sustainable agricultural future.

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