Agri Tech Innovation

Why in News?

IIIT Bengaluru has been developing a host of projects with the idea of introducing higher efficiency in agricultural processes.

What is Agri Tech?

- **Agri Tech** – It is the use of technology to improve farming and agriculture across different value chains.
- **Need for Agri Tech** - Primarily an agrarian economy, India holds large potential for research and technological innovation in agriculture.
- **Potential** - Innovations in this space is estimated to be around $24 billion.
- **Agri Tech areas**:
    - **Precision farming** - Accurate application of resources like water, fertilisers, and pesticides to increase efficiency and reduced environmental impact.
    - **Online Marketplaces** - Selling fertilisers, seeds, farm tools, and other inputs at online marketplaces and mobile applications.
    - **Data-Driven Farming Solutions** - Predict the supply-demand of inputs based on AI and data-driven decisions to help farmers anticipate challenges, plan better, and ultimately improve their crop yields.
    - **Supply Chain Technology** - Platforms that connect farmers directly with buyers, cutting out middlemen and ensuring a more equitable distribution of profits.



What are the technologies launched by IIITB?

- International Institute of Information Technology Bangalore (IIITB) is a premier research Deemed university in Bangalore, India.
- **AutoGrow** - an Autonomous greenhouse System for Precision **Agriculture** for growing food.
    - **Feature** - The system seamlessly integrates biological food production with an IoT/AI-based system
    - Automated greenhouse control of climatic conditions, irrigation, and nutrient supply to plants.
    - **Benefit** - Increasing the efficiency of crop production while using optimal resources and thereby reducing costs.
- **Vertical open field hydroponic system** - It's a non-linear control system where the inputs are continuously monitored, and the required amount of nutrition is administered.
- It is a control system realized with sensors and AI-ML algorithms.
- **Smart Greenhouse Monitoring System** - To transform greenhouse farming by leveraging IoT to improve crop health, automate environmental controls, and facilitate remote monitoring.
    - **Features** - Real-time data monitoring utilising a network of sensors
    - Automated control based on sensor data
    - Remote accessibility for farmers via app
    - Data analysis and alerts with the help of machine learning.
    - **Benefit** - It enables farmers to monitor environmental conditions like temperature, humidity, soil moisture, and pH remotely.

    - Provides real-time data for precise control over crop conditions.
- **AgriSense** - IT is an IoT system to address challenges like deteriorating health of soil due to over application of fertilisers and finding the optimum watering level to ensure maximum output.
    - **Features** – It uses Agri-cone a mushroom shaped soil-monitoring device.
    - The sensors detect gases such as including CO_2 and ammonia.
    - Humidity sensors track air moisture levels around plants, helping to prevent diseases and promote healthy growth.
- **Remote Compost Monitoring system** – It is an intelligent IoT system that remotely monitors and manages compost which can then be used as fertilizer.
    - **Features** - A sensor hub associated with each bin monitors pH values, temperature, humidity, and CO2 levels of the compost inside them.

Challenges in agri tech innovation?

- **Low market adoption** – Use of agri technologies by Indian farmers is very low.
- **High customer acquisition cost** – High initial cost of agri technologies deters farmers from using them.
- **Lukewarm investor interest** – Inadequate interest by investors to invest developing agri tech businesses.
- **Inadequate finances** - Lack of funding in agritech poses a challenge to scaling up and deployment.
- **Fragmentated userbase** - Reaching out to farmers is going to be difficult because the end users are too fragmented.
- **Illiteracy** – Literal illiteracy and digital illiteracy hinders farmers from using agri technologies.

What needs to changed to boost agri tech?

- **Different approach** - Agri-tech needs to be approached differently compared to consumer tech or other sectors which attract large funding.
- **Interdisciplinary approach** – Integrating various technologies to apply on agricultural tech development
- **Digital public goods** - Agriculture is a use case where solutions should be developed as public digital infrastructure.
- **Working with Farmer Producer Organisations (FPO)** - Conducting workshops to speak to farmers to get problem statements from them.

References

[The Hindu | Different approach to Agri Tech]

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