

Answer:

Agriculture in India is the core sector for food security, nutritional security, sustainable development and poverty alleviation. It contributes approximately 15% of the GDP in India, with the potential to contribute more. In this context, e-technologies such as artificial intelligence (AI), machine learning (ML), remote sensing, big data, block chain and IoT, are transforming agricultural value chains and modernizing operations.

The **benefits of e-technology for Indian farmers** are:

- **Improved decision-making:** By having the necessary information, farmers make improved decisions concerning their agricultural activities based on various factors. For instance, weather advisories help the farmers to sow the seeds at relevant time to enhance productivity.
- **Better planning:** E-technology helps to continuously monitor the land so that precautions can be taken at an early stage. It increases productivity, reduces manual work, reduces time and makes farming more efficient. For instance, **big data** collected through mobile imaging, satellite imagery, drone patrolling, GPS / RFID is useful in better planning of available resources like water.
- **Community involvement:** There are several programmes which are made possible by IT applications which promote community involvement in agriculture. With the application of IT, there can be better coordination among the local farmers. This will further lead to improved crop productions facilitating better farm income.
- **Agricultural breakthroughs:** E-technology makes the spread of information concerning the latest agricultural breakthroughs more possible. Sharing information regarding new technologies and inventions to help everyone progress is made easier through resources made available and accessible by IT.

The following steps have been taken by the government towards use of e-technology in agriculture:

- **AGMARKNET:** This e-governance portal facilitates generation and transmission of prices, commodity arrival information from agricultural produce markets, and web-based dissemination to producers, consumers, traders, and policymakers transparently and quickly.
- **Kisan Suvidha app:** It is an omnibus smartphone app that helps farmers by providing them relevant information regarding weather, dealers' market prices, plant protection, agro advisories, IPM practices etc.
 - Various other apps have been launched such as **AI-Sowing app** for optimal date of seed sowing, **Crop Insurance app** to calculate insurance premium, **Agri Market app** for information of market price of all crops within a 50-kilometre radius, **Pusa Krishi app** for information about various crops etc.
- **Bhuvan platform:** ISRO's geo platform, Bhuvan provides valuable data on plantation, pest surveillance and weather.
- **Direct benefit transfer (DBT) Central Agri Portal:** It is a unified central portal for agricultural schemes across the country to help farmers adopt modern farm machineries through government subsidies.
- **e-NAM:** The National Agriculture Market scheme envisages initiation of e-marketing platforms at the national level and supports creation of infrastructure to enable e-marketing in regulated markets across the country.
- **Unified Farmer Service Platform (UFSP):** It is a combination of Core Infrastructure, Data, Applications and Tools that enables seamless interoperability of various public and private IT systems in the agriculture ecosystem across the country.

Further measures are required to address lack of awareness, establish digital infrastructure in rural areas, overcome digital divide and encourage adoption of e-technologies to ensure increased agricultural productivity and income.