Mains Marathon

Day 34: How can Digital revolution in Agriculture solve the challenges of Indian agriculture sector? (150 words)

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Approach / Explaination / Answer

- Write the challenges in Indian agriculture.
- Discuss how Digital revolution solves these challenges with examples such as use of remote sensing, mobiles, drones etc.
- Conclude suitably.

Answer:

Digital technologies, such as **artificial intelligence (AI) and machine learning (ML), remote sensing, big data, block chain and IoT,** are transforming agricultural value chains and modernizing operations. The agriculture and allied sectors grew at a positive growth rate of 3.6 per cent during 2020-21. The share of the agriculture & allied sector in total GVA improved to 20.2% in the year 2020-21 and 18.8% in 2021-22.

The major challenges of the Indian agriculture sector are:

- Food Sufficiency but Nutrition Deficiency
- High import of edible oil and oilseeds
- Yield plateaus
- Degrading soil, Water stress
- Inadequate market infra/linkages
- Unpredictable, volatile prices
- Post-harvest losses, wastages
- Lack of crop planning due to information asymmetry
- Climate Change

Benefits of Digital revolution in Agriculture:

- **Technological interventions** based on **remote sensing, soil sensors, unmanned aerial surveying and market insights,** etc., permit farmers to **gather, visualise and assess crop and soil health conditions** at different stages of production, in a convenient and cost-effective approach. They can act as an initial indicator to identify potential challenges and provide options to deal with them in a timely manner.

- **Artificial Intelligence/Machine Learning (AI/ML)** algorithms can generate real-time actionable insights to help improve crop yield, control pests, assist in soil screening, provide actionable data for farmers and reduce their workload.
- Blockchain **technology offers tamper-proof and precise data about farms,** inventories, quick and secure transactions and food tracking. Thus, farmers don't have to be dependent on paperwork or files to record and store important data.
- The farmer takes **informed decisions on what crop to grow,** what variety of seed to buy, when to sow, and what best practices to adopt to maximize the yield. The agricultural supply chain players plan their production and logistics on precise and timely information.
- **Precision agriculture** becomes a reality with access to the right information at the right time.
- Farmers know whether to sell or store their produce, and when, where and at what price to sell.
- Farmers get the benefits of **innovative solutions and personalized services** driven by emerging technologies with protection of privacy.
- **Renting and sharing platforms for agriculture equipment and machinery:** Owing to both constrained financial resources and small farm plots, opportunity exists for digital platforms that offer equipment renting and sharing services instead of outright purchases.
- **Academic support:** The local agricultural organisation and academic institutes regularly interact with farmers through various locally conducted programs and government initiatives. Training facilities provided by various academic institutes and agricultural organisations will improve digital adoption among farmers.

Current Initiatives under Digital Agriculture in India:

The demand for digitisation in Indian agriculture is well understood and acknowledged, likewise efforts have also been made towards digitising the prevailing value chain.

- The **Digital Agriculture Mission 2021–2025** aims to support and accelerate projects based on new technologies, like AI, block chain, remote sensing and GIS technology and use of drones and robots.
- **National Agriculture Market (eNAM):** Launched in April 2016, the National Agriculture Market (eNAM) is a pan-India electronic trading portal that links the existing Agricultural Produce Market Committee (APMC) mandis, to **create a unified national market for agricultural commodities**. eNAM helps farmers sell products without the interference of any brokers or mediators, by generating competitive returns from their investment
- **Direct Benefit Transfer (DBT) Central Agri Portal:** Launched in January 2013, the DBT Agri Portal is a unified central portal for agricultural schemes across the country. The portal helps farmers adopt modern farm machinery through government subsidies

As the Indian Agriculture and Allied sector is on the verge of adopting modern technologies, such as IoT, AI/ML and agri-drones for unmanned aerial surveying, Indian and foreign agritech players can play a vital role in supplying these advanced technologies to farmers. Currently, there are few players in the market, but catering to ~267 million farmers in a country exhibits a huge opportunity for private and foreign entities to expand their footprint in the country. However, influential factors that will define the success of digital agriculture in India are technology affordability, ease of access and operations, easy maintenance of systems and supportive government policies.