

## Digitalization of Indian Agricultural Transformation- A Need of Hour

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### Introduction:

For almost a decade, the phrase "digital transformation" has been making waves in the agri-food industry. It has made it possible for both corporate and public organizations to use advances in digital technology to rework procedures and find new business models. The word "digital" does not, however, have the same meaning for everyone at every level of the organization. For one person, adopting modern technology may just refer to streamlining corporate procedures and gaining a competitive edge, but for another, it may also imply using it to improve interactions with buyers and consumers. For another person, it can signify the digitization of all data to increase cost and time efficiency.

The term "digital agriculture" can refer to instruments that gather, store, analyze, and/or distribute electronic data and/or information in agriculture. It is sometimes referred to as "smart farming" or "e-agriculture." "A general definition of agricultural transformation is the process over time by which the agrifood system shifts from being farm-centered and geared towards subsistence to being more commercialized, productive, and off-farm focused. One of India's key economic sectors is its agriculture industry, which is currently valued at US\$ 370 billion. According to the Economic Survey 2020-21, The Agriculture sector contributed 19.9% of GDP in 2020–21, up from the 17.8% recorded in 2019–20.

The use of digital farming allows farmers to get knowledge and make decisions that will increase productivity. Popular reasons for the adoption of digital farming include crop and livestock management, pest control, and communication ease in the industry.

### Importance of Digitalization of Agriculture



In this digital era, it is hardly surprising that Technology is breaking its way into the agricultural industry. Digital farming is now a tool that farmers may utilise to gain knowledge and make successful decisions. The implementation of digital agriculture has given farmers a way to increase agricultural productivity, sustainability, and profitability.

Starting with a single farm, the impact may be seen at the micro level. As it increases, it influences global policies at the macro level.

#### **Top Benefits include:**

- Improved decision-making and management procedures
- Improvement in output and revenue
- More target application leads to increase efficiency
- Improved marketing
- Better Documentation
- Current information
- Modernization of record keeping
- Reduces environmental and ecological impacts
- Risk and uncertainty management
- Reduction in regulatory burden
- Save time and Money
- Uplifts the socio-economic status of farmers

#### **Recent Digital Agriculture Initiatives in India**

Over the years, the government has made significant efforts to assist and advance the agricultural industry with tried-and-true farming technologies and encouraging legislation. In September 2021, Mr. Narendra Singh Tomar, Union Minister of Agriculture & Farmers Welfare, announced the launch of the Digital Agriculture Mission 2021–2025 and signed five Memorandum of Understandings (MoUs) to advance digital agriculture through pilot projects with:

1. CISCO
2. Ninjacart,
3. Jio Platforms Limited,
4. ITC Limited,
5. NCDEX e-markets Limited (NeML)

The goal of the Digital Agriculture Mission 2021–2025 is to encourage and speed up projects based on cutting-edge technologies including artificial intelligence (AI), blockchain, remote sensing and GIS, and the usage of robots and drones. Major digital tools have been created by the Ministry of Agriculture & Farmers Welfare to encourage farmers to adopt technology, including:

- National Agriculture Market (e-NAM, 2016)
- Direct Benefit Transfer (DBT) Central Agri Portal, 2013



The Ministry of Agriculture and Farmers Welfare and Microsoft signed a Memorandum of Understanding in June 2021 to operate a pilot programme in 100 communities across six states. According to the MoU, Microsoft will use its cloud computing services to develop a "Unified Farmer Services Interface." This is a key component of the ministry's future ambition to build "Agri Stack," a single platform to offer farmers end-to-end services throughout the agriculture and food value chain.

### Digital Technologies

With over 67% of the US\$124–130 billion market, India is the largest source of goods and services for the information technology (IT) sector worldwide. However, India is still in the early stages of the development of farm technologies that are incorporated with a strong information and communication technology (ICT) framework. It has the potential to significantly improve agricultural performance and increase farmers' income. The goal for Indian agriculture in the past was to produce more food, but the challenge it faces now and in the future is to produce more food in a more equitable and sustainable manner. The use of digital technology in agriculture has been crucial in advancing data collection and cutting-

edge analytics, which empower farmers to make informed farming decisions and reap the rewards of cost-effective input and labour use.

1. **Drones:** Drones' mobility and capacity to view details that are difficult for humans to notice from the ground give them valuable information regarding pest control, fertiliser and pesticide use, irrigation, and harvesting schedules. In China, it already covers 20 million hectares of cotton crop.
2. **Robotics:** Robots have a broad range of applications in agriculture, including monitoring crops, measuring soil pH levels, picking and packing fruits and vegetables, and planting seeds. They can perform both simple and complex tasks, making them a valuable asset to the industry.
3. **IoT And Sensors:** The capacity to track live animals and produce, identify health problems, and monitor the farm environment or soil moisture uptake in real-time is extremely valuable in tackling the significant issues of sustainability and climate change, animal welfare, and supply chain tracking in the food industry.
4. **Artificial Intelligence (AI):** Careers in food and farming often involve learning through practical experience rather than explicit knowledge transfer, leading to challenges such as avoiding human error, misunderstandings, and cognitive bias. The use of AI may pose a threat to extension agents, farming experts, consultants, and other professionals who rely on their expertise.
5. **3-D Printers:** The ability of 3-D printers to repair machinery, print food, or create prosthetics for animals is a significant advantage for farms worldwide. This advantage is even more apparent during times of disrupted supply chains, such as the Covid-19 pandemic, or in regions of the world with their own distribution challenges, such as Africa. The use of 3-D printing in the food supply chain and on farms can provide significant savings and efficiencies.



### Digital agriculture implementation in India

The predominance of segregated small-holder farms in the nation, which makes data collection challenging, is the fundamental reason for the gradual acceptance of digital farming in India. Additionally, limited penetration of mechanization tools and frequent natural calamities, like droughts, floods, and excessive monsoon rains, have negatively impacted the deployment of digital solutions in the sector.

To make digital agriculture successful in India, the following actions could be taken: -

- ❖ Cost-effective technology
- ❖ Platforms for renting and sharing agricultural gear and equipment
- ❖ Portable equipment
- ❖ Academic assistance

### Conclusion

Indian and foreign agritech businesses can play a crucial role in supplying farmers with these cutting-edge technologies since the Indian Agriculture and Allied sector is on the verge of adopting contemporary technology, such as IoT, AI/ML, and Agri-drones for





unmanned aerial surveys. There are currently few competitors in the sector, but serving the nation's 267 million farmers presents a significant opportunity for private and foreign businesses to increase their presence in the nation. It is in the national interest to solve the issues the Indian agricultural industry is facing holistically from an ecosystem perspective in order to achieve goals like sustainable development and double farmer incomes.

Despite these issues, there is no denying that agriculture will continue to undergo digital transformation. FAO is committed to assisting governments and partners in bridging such multidisciplinary digital divides to ensure that everyone benefits from the emerging digital society.

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