Digital Agriculture in Indian Scenario: review

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Abstract: This article gives the important aspects of technological progress in digital agriculture. This has a big impact. With the advent of artificial intelligence, machine learning and digital agriculture implementation challenges, and new applications, agriculture is transforming traditional agricultural practices into a highly modern digital agriculture.

Keywords: Digital Agriculture, Machine learning, Artificial intelligence, Digital farming.

I. INTRODUCTION

The agricultural sector is one of the largest sectors of the Indian economy. According to the economic review, GDP contributions from the agricultural sector are growing every year in recent years, the government has made significant progress in assisting and promoting the agricultural sector through agricultural technologies and policies, support. Recent developments in digital technology in agriculture are accelerating growth by providing high yields and reducing water consumption and improving support through the use of agrochemicals.

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. While several countries, such as the US, Australia and Israel, have successfully adopted and exploited digital solutions to revolutionize agriculture, but adoption in India is still in its infancy. The future adoption of digital agriculture in India is anticipated to nurture under the Public-Private Partnership (PPP) mode.

II. CURRENT INITIATIVES IN DIGITAL AGRICULTURE

The need for digitization of Indian agriculture is well known and recognized, and efforts have also been made to digitize the dominant value chain.To promote digital farming through pilot projects. The Digital Farming Mission aims to support and accelerate projects based on new technologies such as AI, block chain, remote sensing, GIS technology, and the use of drones and robots. Agricultural Digital Infrastructure Solutions improve agriculture and share knowledge. This may play an important role in the data set created by the Ministry of Agriculture in the National Agricultural Stack. A pilot project will be of great helpful for this initiative and development. The ITC is used to propose and create a personalized "Specific Crop Advisor system" service to transform traditional general advice to farmers into personalized and site-specific advice through a digital crop monitoring platform to facilitate the digital applications among farmers.

➢ **National Agriculture Market (eNAM) :**
National Agricultural Market (eNAM) is a pan-Indian e-commerce portal linking existing mandis of Agricultural Products Market Committee (APMC), to create a unified national market for agricultural commodities. eNAM helps farmers sell products without interference from any broker or brokerage, generating a competitive return on their investment.

➢ **Direct Benefit Transfer (DBT) Central Agri Portal:**
 DBT Agri Portal is a unified central portal for agricultural systems throughout the country. This portal helps farmers to adopt modern agricultural machinery with government subsidies.

Technical interventions based on remote sensing, soil sensors, unmanned aerial surveying, market analysis, etc. allow farmers to collect, predict and evaluate crop and soil conditions at different stages of production in a convenient and cost-effective way. They can serve as a starting point for identifying potential problems and providing opportunities to address them in a timely manner. Artificial intelligence / machine learning (AI / ML) algorithms can generate practical information in real time to help increase yields, control pests, assist with soil testing, provide farmers with useful data and reduce their workload. Block chain technology provides accurate and disruptive data on farms, stocks, fast and safe food exchanges and traceability. This way, farmers don't have to rely on documents or records to record and store important data.

III. BENEFITS OF DIGITAL AGRICULTURE

Implementation of these technical solutions enables reliable management and control of real estate. Farmers get a complete digital analysis of the farm in real time, so they can act accordingly, eliminating the need to apply excess pesticides and fertilizers and reducing overall water usage.

- ➤ Increase agricultural productivity and reduce production costs
- ➤ Prevents soil decomposition
- ➤ Reduce the use of chemicals in agricultural production
- ➤ Promote the efficient and effective use of water resources
- ➤ Increase the socio-economic status of farmers
- ➤ Reduces environmental and ecosystem impacts
- ➤ Improve employee safety

IV. IMPLEMENTATION OF DIGITAL AGRICULTURE IN INDIA

The main reason why digital agriculture has been gradually adopted in India is the prominent small farmers isolated in India, which complicates data collection. In addition, the penetration of mechanized devices is limited and frequent natural disasters such as droughts, floods and excessive monsoon rains have a negative impact on the distribution of digital solutions in this sector. Therefore, a customized approach is needed to implement digital farming in a typical small Indian villages. This can be expanded later to be available on many Indian villages.

The following steps can be taken to succeed in digital farming in India:

➤ **Low Cost Technologies:** due to marginal annual income of Indian farmers This low income explains the volatile financial situation run by a typical Indian farmer. Therefore, it helps to reduce the cost of technology.

➤ **Portable Hardware**: Plug and Play hardware has a better opportunity in the Indian market because typical Indian farms are small. In addition, land leasing is widespread in various agricultural agreements, allowing farmers growing on one land to move to another farm next season. In such scenarios, investing in mobile devices is best for farmers.

➤ **Farm Equipment and Machinery Rental and Sharing Platform:** For limited financial resources and small farm plots, there are digital platform opportunities to offer equipment rental and sharing services instead of full purchase. Several Agritech start-ups already offer equipment rental services.

➤ **Academic Support:** Local agricultural organizations and academic institutions interact with farmers on a regular basis through various local programs and government initiatives. The training facilities provided by various academic institutions and agricultural organizations increase digital adoption among farmers.

V. CONCLUSION

India's agricultural and allied sectors have mostly adopted the latest technologies such as IoT, AI / ML and agri-drones for unmanned aerial vehicles in research, so Indian and foreign agricultural engineers are using these advanced technologies to farmers. Can play an important role in providing to. While there are few players on the market today, servicing millions of farmers in the country represents a great opportunity for private and foreign businesses to expand their footsteps in the country. However, influential factors that determine the success of digital agriculture in India are the affordability of technology, ease of access and operation, ease of system maintenance, and government support policies.
Adopting a holistic ecosystem approach to address the challenges facing India's agricultural sector is in the national interest to achieve goals such as doubling farmers' incomes and sustainable development. Therefore, the massive adoption of digital agriculture in India requires the approach of many stakeholders. Governments play an important role in the ecosystem.

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