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Digital Farming- Scenarios In Indian Agriculture

"Empowering Farms With Technology To Feed The World"

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Abstract:
India, being one of the world leading agrarian country, agriculture is the prime backbone of the Indian economy and provider of livelihood , and employability to about half of the population , majorly comprising rural farmers .
Indian agriculture is one of the main contributor of the economic growth of country and at the focal point that will affect other sectors as well as . India is one of the leading producer of Rice, Wheat, Pulses etc at global level and its per capita output is raising steeply in recent past. Yet there is considerable gap in contribution to country GDP and is dragged by intrinsic and extrinsic factors. Amid of the complexities of Indian agriculture system , the goal of sustaining the rural farmers by uplifting income and livelihood, extending the progress and competitiveness of Indian agriculture at world arena, Government of India has been taking initiatives to address the issues. Although initiatives already underway bridging gaps , applying the latest technology will certainly boost in reshaping in agriculture sector. Digital technology infusion in agriculture is one of the trend setter in latest technological innovations and holds some promise for progress in this direction. Some insights were discussed in this paper about the concepts and developments.

Keywords: Agriculture, DAM 2021-2025, Digitization, Precision Farming, IoT

Introduction:

Rapid changes in technology development in recent decades witnessed transformation of people's lives comfortability and different fields also made significant transformation. But Farmers in the agriculture are distant from reaching the opportunities, which have to be addressed . Illiteracy, marginal farms, laxity in networks, equipment and machinery, subsidy evasion by middle and higher group farmers, middle men interventions, lack of integrated forecasting technology, timely financial inputs by funding agencies are some main factors in back dragging progress. Technology at right time at right place will play a central role to overcome these challenges with minimum costs.

Current agriculture worth above $370 billion is one of the major components of the Indian economy. According to the Economic Outlook 2020-21, agricultural contribution to GDP is expected to reach 19.9% up from 17.8% recorded in past years. Proven agricultural technologies and supporting policies have been key steps to increase support for agriculture . Further accelerate growth by ensuring abundant crop yields and increase sustainability through reducing water consumption and reducing the use of chemicals in agriculture. 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 many countries like Netherlands, USA, Australia, Israel have been able to adopting digital and effectively implementing solutions to revolutionize agriculture, in India Adoption is still in its infancy. Future adoption of digital agriculture in India is expected to be promoted from gross root level.

Concept :

The concept ofDigital Farming uses data for creating value. Not only the presence of data, but precise have subtle difference in

optimization process. Data is collected from different fields, analyzed, predicted and communicated to use optimally. Connectivity in rural areas, Non-awareness of diverse farm production functions, need of technical training, cost of software, hardware , lack of scalability and configuration are some key challenges in Digital Farming to be overcome.

Current policies under digital agriculture in India:

The demand for digitization in Indian agriculture is well known and acknowledged, and efforts have also been made to digitize valuable resources. In September 2021, Go I launched the Digital Agriculture Mission 2021–2025, with partnership of Cisco, NinjaCart, Jio Platforms Ltd, ITC Ltd and NCDEX E-Markets digital agriculture through pilot projects. The Digital Agriculture Mission 2021–2025 aims to support and accelerate infrastructure based on new cutting edge technologies, such as AI, block chain, remote sensing , GIS technologies, drones , robots and communication technology. The core functionality of the platform uses data from multiple sources, feeds data into AI/ML algorithms and generates recommendations.

Over 1,000 agri-tech start-ups are based in India, and various venture capital funds, loan funds, and angel investors have long supported the sector. These start-ups have innovative ideas that assist farmers in improving farming techniques and produce.

To provide farmers with real-time data and the necessary advice, NITI Aayog has teamed up with International Business Machines (IBM) to create a crop production forecast model supported by AI. It aids in enhancing crop output, soil quality, agricultural input control, and early disease outbreak warning.

The future of digital agriculture in India

Digital Agriculture Technological interventions based on remote sensing, soil sensors, and unmanned aerial surveys allow farmers to collect, visualize and evaluate crop and soil health conditions at various stages of production, in a convenient and cost-

effective manner. Early indications can be developed to identify potential challenges and provide timely solutions. Artificial intelligence/machine learning (AI/ML) algorithms can provide insights that can be used in real time to improve crop yields, help prevent pests, assist with soil testing, provide information that can to use for farmers, reducing their labor. Block chain technology provides tamper-proof and accurate data on farms, inventory, quick and secure transactions and food inspection. Therefore, farmers do not have to rely on paper or files to record and store important information. Benefits of Digital Agriculture. The use of these technological solutions enables farms to be controlled and managed more efficiently. As farmers receive comprehensive digital in-field analysis in real time, they can respond accordingly and without the need to apply additional pesticides and fertilizers to reduce overall water consumption on.

Implementing digital agriculture in India :

The main reason for the slow adoption of digital agriculture in India is the popularity of small isolated farms in the country which account for 85% of the total operational holdings , this makes data collection difficult other than limited availability of mechanization, natural disasters. For implementing digital farming will require a customized approach, this can be scaled up later and made available to more Indian farms. The strategies that can be used to enhance digital farming in India is by applying Low Cost Technology, plug and play Portable Hardware, and Providing Farm equipment and machinery on rentals and distribution channels.

As per NITI Ayog research on AI, 4 per cent or above expansion rate of agriculture is needed to reach annual growth of 8-10 percent and AI worth will be $2.6 Bn and will rise at 22.5 per cent.

Conclusion:

As the Indian agriculture sector moves towards adopting modern technologies, such as IoT, AI/ML and agri-drones for

unmanned aerial surveys, Indian and foreign agri-technology players can play a key role in that providing these advanced technologies to farmers. Currently, there are few players in the market ~267 million farmers fed in one country provides huge opportunities for private and foreign companies to expand their footprint in the country but the influential factors that will determine the success of digital agriculture in India are affordability of technology and prices, ease of access and use, ease of management of systems and supportive government policies It is in the national interest to adopt a holistic approach to address the challenges faced by the Indian agricultural sector, for example, to achieve goals such as doubling farmers' income and sustainable development. Thus, widespread adoption of digital agriculture in India will require a pluralistic approach, with government playing a key facilitating role in the ecosystem

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