

Application of Information Technology in the Agriculture Sector of Indian Economy

Nandini N. Gaikwad¹, Pooja P. Thakur², Vrushali M. Thakur³, Sanjay L. Gaikwad⁴

Assistant Professor & Head, Department of Information Technology¹

Assistant Professor, Department of Information Technology^{2,3}

Assistant Professor & Head, Department of Physics⁴

Mahatma Phule A. S. C. College, Panvel, Raigad, Maharashtra, India

Corresponding Author: nng191211@gmail.com¹

Abstract: *Agriculture is one of the most important sectors in India and the pillar of the Indian economy. Now it demands the transfer of technologies from lab to land for the second green revolution. Particularly for small and marginal farmers the generation, invention, and application of agricultural knowledge are progressively important, who need relevant information to improve, sustain, and diversify their farm enterprise. Information technology supports new methods and ideas for healthy and precision agriculture. Information technology has the potential tool for improving decision-making in agriculture. IT can improve farm management and farming technologies by efficient farm management. The extensive use of IT to make a direct contribution to agricultural productivity. Satellite technology, geographic information systems using the techniques of agronomy and soil science is to increase agricultural production. In this paper, we study how information technology is helpful for management, improving planning and superior produce of agro products, and the basic issues of information technology in farm practice.*

Keywords: Agriculture, Information Technology, Agricultural Productivity

I. INTRODUCTION

Agriculture is one of the most important sectors in India and ICT applications can be of great benefit in transforming the socio-economic conditions of the poor, especially in the backward areas. Agriculture is the main source of livelihood and most of the rural poor depend on rainfed agriculture and fragile forests for their livelihood. The service role of IT can enhance the opportunities of rural communities by improving market information and lowering transaction costs for poor farmers and traders. The National Policy on Farmers emphasizes the use of information and communication technology (ICT) at the village level to provide appropriate advice and necessary information to the farmers.

Information technology (IT) is the branch of engineering that deals with the use of computers and telecommunications to create, process, store, retrieve, and exchange all kinds of electronic data and information, which are aimed to improve the efficiency of different sectors. Among the sector that utilizes IT in agriculture. The Agriculture sector experienced optimistic growth in the past two years, The country's gross value added (GVA) accounted for a large 18.8% (2021-22) growth of 3.6% in 2020-21 and 3.9% in 2021-22.^[5]

Recent advances in information/digital technology in agriculture have accelerated growth by increasing crop production and increasing sustainability by reducing water use and agricultural chemicals. Digital/Information Technologies such as artificial intelligence (AI) and machine learning (ML), remote sensing, big data, blockchain, and IoT are changing agricultural value chains and modernizing operations. Many countries have successfully adopted and used digital solutions to revolutionize agriculture, but their adoption in India is still in its infancy. The adoption of digital agriculture in India is expected to increase in the future under the public-private partnership (PPP) mode. The demand for digitization in Indian agriculture is well understood and acknowledged.^[5]

Some of the roles of Digital/Information technology in the agricultural sector include:

- Productivity improvement
- Community involvement
- Good post-harvest practices and value addition of farm produce
- Improved decision making by the farmer
- Improved efficiency and service delivery at the farm
- Weather forecasting and climate-smart farming.
- GPS location and Remote sensing

II. FUTURE OF IT IN AGRICULTURE IN INDIA

It is possible to develop a technically sound system to meet the information needs of Indian farmers. User-friendly systems, especially with content in local languages, can generate interest among farmers and others working at the grassroots. It is possible to create a dedicated network or use the power of the Internet to make these services available in all parts of the country

2.1 Application of IT in Agriculture

Technical interventions based on remote sensing, soil sensors, unmanned aerial surveys and market insights, etc., allow farmers to compile, visualize and assess crop and soil health conditions at different stages of production, from a convenient and cost-effective perspective. They can serve as an initial indicator for identifying potential challenges and provide options for tackling them quickly

Artificial Intelligence / Machine Learning (AI / ML) algorithms can create real-time actionable insights to improve crop yields, control pests, assist in soil testing, provide actionable data for farmers, and reduce their workload

Blockchain technology provides tamper-proof and accurate data about farms, inventory, fast and secure transactions, and food tracking. Thus, farmers do not have to rely on documents or files to record and store important data.

2.2 Benefits of IT in Agriculture

Implementing the technical measures which enable reliable management and monitoring of farms. Since farmers get a complete digital analysis of the field in real-time, they can operate accordingly and they do not need to use excess pesticides, fertilizers and reduce total water consumption.

Other benefits include:

- Increases agricultural productivity and reduces production costs
- Prevents soil erosion
- Reduces chemical use in crop production
- Promotes efficient and efficient use of water resources
- Improves socio-economic status of farmers
- Reduces environmental impact
- Increases worker safety
- include timely information on weather forecasts and calamities.
- Better and spontaneous agricultural practices.
- The facility of online trading.

2.3 Impact of IT Application in Agriculture

It is to be mentioned that IT offers a variety of programs for both economic and social development. Before and after the application of ICT in the field of agriculture, it was felt necessary to assess the impact to determine whether there have been any significant changes in favor of farmers. It is important to note that the change that does not occur to the farmer before applying for ICT in the field of agriculture, may occur after the farmer has applied for ICT in his field of agriculture. Researchers, through their observations and interactions with farmers, have identified eight economic and

social characteristics that farmers may or may not have before the application of ICT in their agricultural field. Thus, the economic and social characteristics of the study include improving productivity, avoiding credit purchases, comfortable living, reducing poverty, improving housing, liberal spending, lifestyle changes, and improving childcare (Venkatesh et al., 2012).

2.4 Challenges

- The lack of reliable internet connectivity in rural areas
- Poor literacy level
- Farmers benefits more from simple technology, which communicates information, which is relevant and easy to understand
- Door delivery of information is limited by the fact that there is a very large number of farm households and many families may not own radios or television sets and may not have access to a daily newspaper

III. CONCLUSION

Indian farmers and those who are working for their welfare need to be e-able to cope with the emerging situation to fully or partially deregulate and reduce government protection, open up agricultural markets, fluctuate agri-environment, and take advantage of potential export opportunities. The quality of rural life can also be improved through quality information input which provides better decision-making ability. IT can play a key role in meeting these challenges and facilitating the transformation process of rural India to overcome the rapidly growing digital divide. Through this study, the authors conclude that the Government of India is making significant strides in providing various facilities to farmers, especially in the field of agriculture. In which farmers are being helped to understand modern cultivation methods, availability of agricultural inputs, availability of irrigation resources, availability of pesticides and fertilizers to increase crop production and productivity. Existing barriers need to be removed immediately when undertaking works. It is necessary to formulate a national policy for access of information technology in rural India. The National Coordinating Agency, which has an advisory role, can act as a catalyst in this process. No single organization can succeed in the work of e-Shakti in farmers and rural India. At the same time, scattered and partial attempts to accomplish the goal cannot succeed. Industries with major partnerships in villages, such as the fertilizer sector, should come together to get started. The success of any IT-based service in rural India depends on developing the right revenue model for dissemination points. Information kiosks can generate revenue from the industry by providing and disseminating essential services. Once this proliferation point is proven to be economically viable, the IT revolution in rural India will no longer need a crusade.

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