



The Role of Technological Advancements in Shaping Modern Indian Agriculture

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India has been an agricultural economy since it provides livelihood to 58% of the Indian population, contributing 14% of the total GDP. The Green Revolution brought a transformative change in agriculture and helped in securing food for the increasing population.

However, despite its progress, Indian agriculture faces many challenges the climate change crisis, energy crisis, lack of fertile land, loss of biodiversity, weak extension machinery, rising input costs, weak extension machinery, and lack of access to markets. There is an urgent need to improve Indian agriculture including technological advancements to meet these challenges and meet the consumer demand.

The diffusion of the technology in Indian agriculture sector was initiated through the National Agricultural Research Systems (NARS) of the Indian Council of Agricultural Research (ICAR). The integration of Information & Communication Technology (ICT) in Indian agriculture was a major milestone that links our domestic market with the international market. Mobile phones and the internet became important tools for weather forecasting, analyzing market conditions, and prices, disseminating agricultural information, etc. Platforms like the Agricultural Innovation System (AIS) play the main role in interlinking farmers, entrepreneurs, and researchers under the same umbrella.

Drip and sprinkler irrigation methods have replaced traditional flood irrigation, reducing water wastage and improving water use efficiency. This was also crucial for Indian states facing drought, and water scarcity problems. Furthermore, the genetic modification of seeds enhances their resilience to climate crisis which leads to floods, drought, etc. The use of Remote sensing technology is used to estimate crop yield, forecast agricultural productivity, and analyze climate change and the crisis caused due to it. By employing GPS, drones, and sensors, farmers can analyze soil conditions,

weather patterns, and crop health through real-time data. The adoption of blockchain technology boosts consumer confidence and enables farmers to reap good prices for their produce. The e-markets have transcended the physical boundaries, connecting producers to a diverse range of consumers across the world.

However, there are many challenges in the adoption of technology in agriculture. The digital divide, lack of infrastructure, the financial constraint is the main hindrance in the way. Also, there is a lack of required skills among our farmers. It's important to ensure our farmers particularly those from older generations have the required skills to navigate and benefit from digital technologies and modern technologies.

To address government must take necessary steps like providing financial support to farmers, subsidizing seeds, and promoting digital literacy through training and workshops. Private sectors like NGOs, industries, etc. can also play instrumental roles by collaborating with governments and working to bridge the technological divide in our agricultural system.

Conclusion

The Indian agricultural sector needs to be revitalized to meet the demand for food of the growing population and combat challenges like hunger, and malnutrition still prevalent in the Indian population. While the first Green Revolution helped in meeting the production demands in the 1960s, the next revolution needs to focus on the holistic development of the sector and sustainability in the long run. The main pillar of the Agriculture Innovation system is technological advancements. The adoption of mechanization, adoption of technologies like drip technology, biotechnology, remote sensing, GIS, drones, and robotics have brought a trajectory in our modern agriculture shaping into one of the important sectors of developing India. These pioneering developments not only propelled our agriculture system but opened the door to a new era

based on research and development. To secure a prosperous future, it's the need that we should together work to combat the challenges in the way of our modern agriculture. The paradigm shift in agricultural technologies and their adoption will not only empower our farmers but will also form a sustainable future for all.