

DIGITAL AGRICULTURE CHALLENGES AND OPPORTUNITIES IN AGRICULTURE EDUCATION

Agriculture and its allied activities act as the main source of livelihood for more than 80% population of rural India, but its contribution to GDP is less than 20%. India emerged from a food deficient to food surplus nation with spectacular growth in agriculture sector since 1966. Today, India is one of the major exporters of food grains. The food grain production of India increased from 51 million tons in 1950 to about record 273.38 million tons in 2016-17. This growth represents a remarkable achievement in the history of world agriculture. India has achieved significant growth in agriculture, milk, fish, oilseeds, fruits and vegetables owing to green, white, blue and yellow

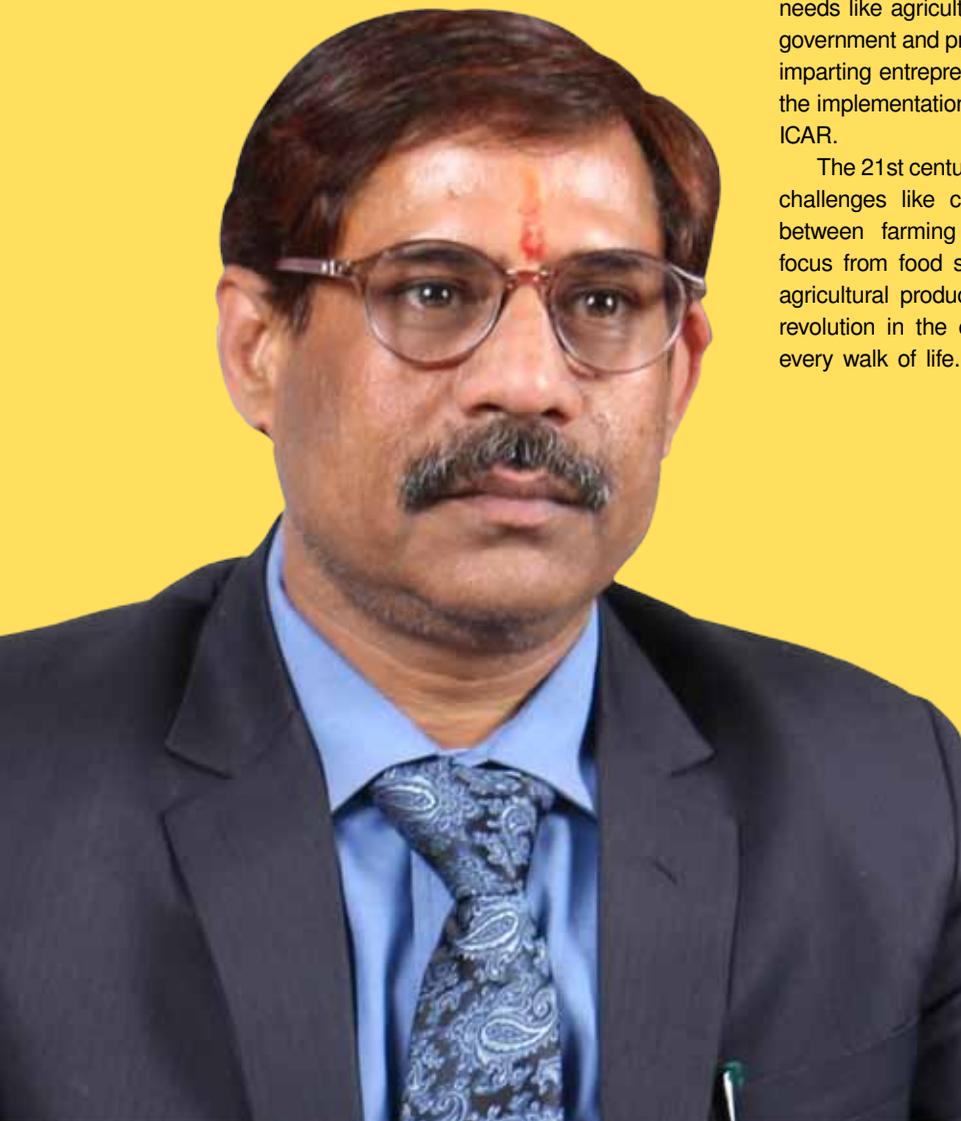
revolutions.

Agriculture Education has played pivotal role in the agricultural development in the country. The foundation for full-scale agricultural education in India was laid in 1960 with the establishment of first Agricultural University (AU) at Pantnagar. The university later became the harbinger of green revolution in the country.

Later, State Agricultural universities were established across the country which played crucial role in development of agriculture and allied sector across the country.

Initially, agricultural education was structured with the major focus of developing human resource with to cater the needs like agricultural research and extension activities in the government and private sector. Of late, focus is shifting towards imparting entrepreneurship-oriented agricultural education with the implementation of 5th Dean Committee recommendation of ICAR.

The 21st century agricultural sector in India is facing several challenges like climate change, growing financial disparity between farming and other sectors, demand for shifting focus from food security to nutrition security, and sustaining agricultural production under limiting land resources. The IT revolution in the century has brought digital technologies to every walk of life. The emerging tools and technologies from



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developing the ICT ecosystem has huge potential to address the hitherto unresolved issues of Indian agriculture like enhancing resource efficiency of small holder farmers through community level planning and deployment of site specific interventions. In this direction, the concept of 'Digital Agriculture' has gained global importance and is considered as the future of farming.

Initiatives Taken By GOI

Digital Agriculture is an emerging concept which is an amalgamation of the concepts of precision farming and smart farming. Precision farming aims at enhancing resource use efficiency by site-specific application and optimization of inputs. The decision making under precision agriculture requires assessment of special and temporal data of several sites of the individual farms derived from various sensors.

Smart farming is aimed at optimizing complex farming systems using information and data technology tools. Digital Agriculture is essentially using digital technologies, like artificial intelligence (AI), machine learning (ML), remote sensing, big data, block chain and IoT (Internet of Things), etc. to help farmers to take right farming decisions and help to enhance overall agriculture system productivity. Digital Agriculture is an emerging field in Indian Agriculture, poised to bring revolutionary changes from crop production to marketing and value chain creation.

Although the digital agriculture is still nascent in India, several initiatives have been made by GOI to accelerate the introduction of various digital tools in Agriculture. Govt. has initiated Digital Agriculture Mission 2021-2025, in partnership with various private agencies during September 2021. Enabling Drone Technology in Agriculture by launching SOP's for use of Drone in Agriculture was brought during December 2021. Schemes like "Swamitva" to draw drone based maps of each village. All these initiative would help in accelerating development digital agriculture.



Agricultural Education in Digital Era

In order to sustain, diversify and realize the potential of agriculture sectors, it is necessary to develop skilled human resources. Agricultural human resource development is a continuous process undertaken by agricultural universities. Agricultural Education in India was always dynamic and embraced several emerging technologies like the emergence of Agricultural Biotechnology. Similarly, it is the time to bring 'Digital Agriculture' into mainstream course curriculum of agriculture and allied streams.

Incorporation of Digital Agriculture as part of agricultural education will help to develop next generation human resource

who could take up real world challenges in implementation of digital agriculture and taking farming to next level. Apart from that, the future agriculture sector based on digital agriculture would also bring several entrepreneurship opportunities which need to be exploited to its full potential.

Agriculture Education need to be revamped to exploit new employment and entrepreneurial opportunities in the field of robotics and drones in agriculture, consultancy services, digital crop health services, big data analysis, etc.

Entrepreneurship and employment opportunities under Digital Agriculture

Key Initiatives Required in Agriculture Education

- Development of course curricula in line with developing digital world including focus on e-learning as envisaged in the new education policy
- Design & development of region specific and need-based vocational courses with focus on developing digitally enabled human resources
- Focus on enhancing the learning outcomes though adopting emerging teaching technologies



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Dr Sohane likes traveling and he enjoys spending time with his pet Oreo