

Agricultural Education & Training in India

Mains: *GS II – Government Policies and Interventions for Development in various sectors*

Why in News?

The government of India has introduced several schemes and programmes for developing the agricultural education in India.

What is Indian Council of Agricultural Research (ICAR)?

- **Apex body for agri research and education** – Indian Council of Agricultural Research (ICAR), established in 1929 (under the Department of Agricultural Research and Education, Ministry of Agriculture and Farmers Welfare), is India's premier organization for coordinating agricultural research and higher education. It is responsible for guiding research institutes and universities in agriculture, horticulture, fisheries, and animal sciences.
- **Nationwide network** – ICAR oversees a vast system, 113 national research institutes and 74 agricultural universities across India, making it one of the world's largest agri research networks.
- It spearheaded the Green Revolution and continues to lead in developing climate-resilient, high-yield varieties and farming technologies.
- **Extension and quality** – Through its divisions, ICAR manages 731 Krishi Vigyan Kendras (KVKs) to transfer technologies to farmers.
- It also sets academic standards, issuing the 'ICAR Model Act (Revised 2023)' and 'Minimum Requirements for Establishing the Agricultural Colleges', and accredits institutions via the National Agricultural Education Accreditation Board.

What are the important Public and Private Institutions?

- **Government universities and institutes** – India has
 - 63 State Agricultural Universities (SAUs),
 - 3 Central Agricultural Universities (CAUs) (Pusa, Imphal, Jhansi).
 - 4 "Deemed" universities (IARI-Delhi, NDRI-Karnal, IVRI-Izatnagar, CIFE-Mumbai).
 - 4 Central Universities with agriculture faculty.
 - The ICAR network also includes 11 ATARI (Agricultural Technology Application Research Institutes) centres.
- **Private sector** – Agricultural education falls under the purview of State Governments, which have their own policies for establishing and promoting private institutions.
- ICAR's role is limited to granting accreditation upon request.

- Over the past five years, the number of ICAR-accredited private agricultural colleges has risen from 5 in 2020-21 to 22 by 2024-25.
- **Central Agricultural Universities** - Currently, three Central Agricultural Universities (CAUs) operate in India.
- Each was created by an Act of Parliament to serve regional needs:
- **Dr. Rajendra Prasad CAU, Pusa (Bihar)** - Converted to a CAU in October 2016 from the former Rajendra Agricultural University (Estd. 1970).
- It has 8 constituent colleges:
 - Tirhut College of Agriculture
 - Post Graduate College of Agriculture
 - College of Agricultural Engineering and Technology
 - College of Community Science
 - College of Basic Sciences and Humanities
 - College of Fisheries
 - Pt. Deen Dayal Upadhyay College of Horticulture and Forestry
 - School of AgriBusiness & Rural Management
- **Central Agricultural University, Imphal (Manipur)** - Established in January 1993 under the Central Agricultural University Act, 1992.
- The university serves seven Northeastern hill states, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Sikkim, Nagaland, and Tripura.
- **Rani Lakshmi Bai CAU, Jhansi (Uttar Pradesh)** - Established as an Institution of national importance under *the Department of Agricultural Research and Education (DARE)* by an Act of Parliament.
- The university serves as a centre of excellence in agricultural sciences, dedicated to advancing education, research and extension services in India.

What are the applications of Internet of Things (IoT) and Artificial intelligence (AI) in Agriculture?

- **Technology Adoption** - The government is actively promoting the Internet of Things (IoT) and Artificial Intelligence (AI) to modernize farming.
- Applications include precision farming (sensor-driven irrigation, automated machinery), drones for imaging and spraying, livestock monitoring, climate-smart greenhouses, AI-driven pest/crop monitoring, and remote sensing.
- **Innovation Hubs** - Under DST's National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS), 25 Technology Innovation Hubs (TIHs) were set up nationwide focused in the application of IoT and AI in agriculture.
 - **For example**, IIT Ropar's Agri/Water TIH, working on IoT sensors for saffron production and supply all over India.
- **Digital Infrastructure** - The Ministry of Electronics has established Centres of Excellence on IoT in cities like Bengaluru, Gurugram, Gandhinagar and Visakhapatnam.
 - **For instance**, it focuses on agri-tech and connects startups, industry, investors, and academia to democratize innovation.
- **Start-up Ecosystem** - The *"Innovation and Agri-Entrepreneurship Development"* programme under the Rashtriya Krishi Vikas Yojana (RKVY) has been fostering

innovation and agripreneurship by offering financial assistance and strengthening the agri-incubation ecosystem.

- The initiative supports start-ups in agriculture and allied sectors, with the dual aim of boosting farmers' incomes through new opportunities and generating employment for rural youth.

What are the schemes for skilling and training of farmers?

- **Krishi Vigyan Kendras (KVKs)** - These ICAR-run centers are the frontline for farmers training.
- KVK courses cover improved agronomy, livestock care, soil health, post-harvest tech, etc., tailored to local conditions.
- **ATMA (Extension Reform Scheme)** - The Agriculture Technology Management Agency (ATMA) scheme plays a key role in strengthening decentralized agricultural extension.
- **Skill Training of Rural Youth (STRY)** - STRY provides short vocational courses (about seven days) in agri/allied trades (horticulture, dairy, fisheries, etc.).
- The program aims to boost self-employment and create skilled manpower in villages.
- **Farm Mechanization (SMAM)** - The Sub-Mission on Agricultural Mechanization (SMAM) provides training on farm machinery use.
- **Soil Health Card Scheme** - This program issues soil health cards and educates farmers on balanced fertilization.
- **Farmer Producer Organizations (FPOs)** - To build market-oriented capacity, the government has registered over 10,000 FPOs.
- Through digital modules and webinars, farmers in FPOs receive training on agri-business management, value chains and marketing.

What lies ahead?

- India's agricultural education and training system today reflects a well-integrated approach linking education, research, technology, and field-level skill development.
- Guided by the vision of "One Nation - One Agriculture - One Team," institutions such as ICAR, Central and State Agricultural Universities, and Krishi Vigyan Kendras have created a strong foundation to make farming more productive, sustainable, and knowledge-driven.
- The continuous emphasis on quality education, accreditation reforms, and farmer-centric training is helping bridge the gap between scientific research and practical applications.
- As India aims for self-reliance in food production and a resilient rural economy, strengthening this synergy between education, innovation, and skilling will remain central to the nation's agricultural progress.

Reference

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