

ITEC Training Programme on

“Integration of Remote Sensing, GIS, Drones and AI in Agriculture Extension”

Introduction: The integration of remote sensing, artificial intelligence (AI), drones and geographic information systems (GIS) with satellite technology has revolutionized agriculture by providing valuable insights and enhanced decision-making capabilities. The integration of satellite technology with AI, drones, and GIS plays a pivotal role in modernizing agriculture, promoting sustainability, and addressing the challenges faced by the agricultural sector. These technologies empower farmers with timely, accurate, and actionable information for efficient and sustainable farming practices.

Rationale behind the training programme: Orienting agricultural extension functionaries towards satellite technology applications is imperative for enhancing their ability to support farmers effectively. With a grasp of precision agriculture, crop monitoring, and early disease detection through satellite imagery and AI, extension workers can empower farmers to optimize resource use, reduce input costs, and mitigate risks. Equipping them with knowledge about land use planning, water management, and climate resilience will enable these functionaries to guide farmers in adopting sustainable practices. Additionally, understanding global food security dynamics and the efficient use of decision support systems can further aid in addressing contemporary agricultural challenges. By imparting these skills, agricultural extension workers can play a crucial role in advancing the adoption of technology for sustainable and productive farming practices.

Justification for conducting the training programme at MANAGE, Hyderabad: Conducting the proposed training program at MANAGE, Hyderabad is strategically aligned with the institute's mission to enhance the capabilities of agricultural extension functionaries. MANAGE, being the National Institute of Agricultural Extension Management, is well-positioned to host this comprehensive workshop on advanced agricultural technologies. Hyderabad's status as a major hub for technology and agriculture makes it an ideal location for professionals to converge and explore the synergies between remote sensing, GIS, drones, and artificial intelligence in agriculture.

Moreover, MANAGE's strong network within the agricultural community ensures that the knowledge gained during the training can be effectively disseminated to farmers

across different regions. The collaboration between MANAGE and the training programme aims at empowering agricultural extension workers with the necessary skills to apply cutting-edge technologies, ultimately contributing to the modernization and sustainability of agriculture practices in India.

Objectives of the training programme:

1. To equip the participants with hands-on experience and proficiency in utilizing satellite technology, GIS, drones, and AI tools for agriculture.
2. To provide insights to the participants into precision agricultural practices through GIS mapping, optimizing inputs, and improving overall resource efficiency.
3. To provide opportunities for networking, knowledge-sharing, and collaboration among agriculture professionals and fostering a community of practice.

Tentative Programme Schedule

	Day - 1
9.30 am – 10:30am	Registration
10.30 am – 11:15	Inauguration
11.15 am	Tea Break
11.30 am	Icebreaking – Interactive Session
	Pre-Training Test
	Program Overview and Experience sharing
01.00 pm	Lunch
02.00 pm	Introduction to GIS and Its Applications in Agriculture
03.30 pm	Tea Break
03.45 pm	Basics of Remote Sensing for Agriculture
05:15 pm	Close
	Day- 2
09:30 – 11:15 am	Introduction to GIS Software
11.15 am	Tea Break

11.30 am	Case Studies: Successful Applications of Remote Sensing and GIS in Agriculture
01.00 pm	Lunch
02.00 pm	Smart farming and IoT
03.30 pm	Tea Break
03.45 pm	Remote Sensing Platforms and Sensors
05:15 pm	Close
	Day 3
	Study Tour: National Institute For Geo-Informatics Science And Technology, Hyderabad
	Day -4
09:30 – 11:15 am	Satellite Technology for Crop Monitoring
11.15 am	Tea Break
11.30 am	Types of Satellites and Their Applications
01.00 pm	Lunch
02.00 pm	Image Acquisition and Interpretation
03.30 pm	Tea Break
03.45 pm	Using participatory GIS (PGIS) tools for assessments at community level
05:15 pm	Close
	Day - 5
09:30 – 11:15 am	Practical Session: Analyzing Satellite Imagery
11.15 am	Tea Break
11.30 am	Satellite Image Processing Techniques
01.00 pm	Lunch

02.00 pm	Group Exercise: Identifying Crop Features from Satellite Imagery
03.30 pm	Tea Break
03.45 pm	Group Exercise: Identifying Crop Features from Satellite Imagery
05:15 pm	Close
	Day - 6
09:30 – 11:15 am	Precision Agriculture Concepts
11.15 am	Tea Break
11.30 am	GIS Mapping for Precision Agriculture
01.00 pm	Lunch
02.00 pm	Precision Farming Technologies
03.30 pm	Tea Break
03.45 pm	Precision Farming Technologies
05:15 pm	Close
	Day - 7
	Study Tour: International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad
	Day - 8
09:30 – 11:15 am	Integrating GIS and remote sensing for sustainable agriculture
11.15 am	Tea Break
11.30 am	GIS Data and Precision Farming
01.00 pm	Lunch
02.00 pm	Case Studies: Precision Agriculture Success Stories
03.30 pm	Tea Break
03.45 pm	Case Studies: Precision Agriculture Success Stories

05:15 pm	Close
	Day - 9
09:30 – 11:15 am	Introduction to Drones and UAVs
11.15 am	Tea Break
11.30 am	Drone Technology for Crop Monitoring
01.00 pm	Lunch
02.00 pm	Practical Session: Drone Operation and Flight Planning
03.30 pm	Tea Break
03.45 pm	Image Acquisition and Processing with Drones
05:15 pm	Close
	Day 10
	Study Tour: National Institute of Plant Health Management (NIPHM), Hyderabad
	Day-11
09:30 – 11:15 am	Early Detection of Crop Diseases using Remote Sensing
11.15 am	Tea Break
11.30 am	Practical Session: Analyzing Disease Patterns in Remote Sensing Data
01.00 pm	Lunch
02.00 pm	GIS and Remote sensing for Food Security
03.30 pm	Tea Break
03.45 pm	Group Exercise: Developing a Disease Detection Plan
05:15 pm	Close
	Day-12
09:30 – 11:15 am	Basics of Artificial Intelligence (AI)
11.15 am	Tea Break

11.30 am	Applications of AI in Agriculture
01.00 pm	Lunch
02.00 pm	Machine Learning for Crop Yield Prediction
03.30 pm	Tea Break
05:15 pm	AI-based Decision Support Systems
Day-13	
09:30 – 11:15 am	Group Discussion: Integrating Remote Sensing, GIS, Drones, and AI in Agriculture
11.15 am	Tea Break
11.30 am	Visit to T-Hub
01.00 pm	Lunch
02.00 pm	Visit to We-Hub
05:15 pm	Close
Day-14	
09:30 – 11:15 am	Back At Work Plan
11.15 am	Tea Break
11.30 am	Back At Work Plan
01.00 pm	Lunch
02.00 pm	Post-Training Test Review and Feedback of the Training Programme
03.30 pm	Tea Break
03.45 pm	Valedictory
5:30 pm	Close

Expected learning outcomes from the course

- Enhanced knowledge and understanding of participants about Remote sensing, GIS, Drones and AI in Agriculture.

- Improved practical knowledge of participants on innovative and emerging trends of Remote sensing, GIS, Drones and AI in Agriculture.
- The course will provide a holistic understanding of challenges and opportunities to adopt strategies in recent trends in agriculture development.

Eligibility Conditions of the participants

1. Reasonable level of experience in Public/ Private/ Civil Societies in Agriculture and allied sectors in the training theme area.
2. Applicant shall possess physical and mental skills and abilities for successfully completing the program.
3. Working knowledge of English is mandatory to understand the training content on sustainable agriculture development.

Additional details for uploading on ITEC portal:

Educational qualifications of candidates	Graduates and Post graduates in agricultural science
Work experience (required) if any	Working experience in the field of agriculture and rural development for minimum 5 years is desired
Minimum age	30 years
Maximum age	50 years
Target Group (level of participants, target ministries or dept. etc.)	Middle level Officers from Department of Agriculture, Non-Governmental Organizations, Farmer producer Company or Universities working in Agriculture sciences
Number of days of local trips	5 (Tentative)
Number of days for outstation trips	03
Number of nights for outstation trips	0

Places to be visited	Hyderabad, Ramoji, Statue of Equality
Mode of transport	AC Bus
Transportation charges (approx.)	INR 50,000/- per batch
Accommodation charges, if hotel is required to be hired	NA
Entry ticket charges	INR 4500 per candidate

Course Director Details

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