

Building Climate Resilient Agriculture: Lessons from Indian Experiences for Extension Professionals

Course Title	Building Climate Resilient Agriculture: Lessons from Indian Experiences for Extension Professionals		
ITEC Coordinator/ Course Director	Dr. N. Balasubramani Director (Climate Change and Adaptation (CCA))		
Course Duration:	July 16-29, 2025		
NO. of days of training	Days = 14	112 Learning hrs (approximate):	
Accommodation	Type: Hostel	Distance from Campus	Within campus/
Airport (nearest)	Location:	RGIA, Shamshabad	Distance from campus/accommodation 15 kms
Batch Size	Minimum Participation =25		Maximum participation =30
Study tour	City	Places	No. of days

Prelude

Climate change is disrupting agricultural production systems, thereby threatening global food security. With approximately 2.6 billion people worldwide rely on agriculture and related activities for their livelihoods (Dickie et al., 2014), these disruptions pose significant risks to their income and food sources. The primary cause of climate change is the variation in greenhouse gas (GHG) concentrations in the atmosphere. India, as the third-largest emitter of GHGs globally, contributes about 6.55% of the world's total emissions. Projections suggest that India could face a loss of upto 2.5% of its GDP by 2050 due to climate change. Additionally, the anticipated yield loss from climate change is estimated between 4.5% and 9%, resulting in a corresponding annual GDP loss of approximately 1.5% (Vijayan and Viswanathan, 2018). The impacts of climate change in India include both a decline in agricultural productivity and a rise in food prices, pushing an estimated 42 million people further into poverty and leading to a 0.4% decrease in overall consumption. To mitigate these risks, India has initiated several policy and programmatic interventions. Notably, India's Intended Nationally Determined Contributions (INDCs) aim to reduce the

emissions intensity of GDP by 33-35% below 2005 levels by 2030, while also creating an additional carbon sink of 2.5 to 3 billion tonnes of CO₂ equivalent through expanded forest and tree cover. In line with the recent pledge at COP26 in Glasgow (2021), India has committed to achieving net-zero emissions by 2070. Agriculture as a vital sector, can play a significant role in achieving this goal through the adoption of appropriate technologies and best practices for climate adaptation.

Current Landscape of Climate-Resilient Agriculture

In response to climate change, the Indian government launched the National Action Plan on Climate Change (NAPCC) in 2008, consisting of eight missions to mitigate and adapt to its adverse effects. One of these missions, the National Mission for Sustainable Agriculture (NMSA), focuses on promoting sustainable agricultural practices to enhance the adaptive capacity of farms. The National Innovations in Climate Resilient Agriculture (NICRA), launched in 2011 by the Indian Council of Agricultural Research (ICAR), is another key initiative aimed at enhancing the resilience of Indian agriculture to climate change. NICRA has identified 151 climate-vulnerable villages and is working to improve their adaptive capacities through strategic research and technology demonstrations. Additionally, the National Disaster Management Authority (NDMA) plays a crucial role in formulating policies, plans, and guidelines for disaster preparedness and post-disaster management. The concept of Climate Smart Villages (CSVs) has been promoted in India by the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) as a response to climate-related risks.

Several projects supported by international organizations, such as the World Bank are also helping to promote climate-resilient agricultural practices. Examples include the Tamil Nadu Irrigated Agriculture Modernization Project (TNIAM), the Project on Climate Resilient Agriculture (PoCRA) in Maharashtra and the Climate Change Knowledge Network in Indian Agriculture (CCKN-IA) in Maharashtra, Jharkhand and Odisha. These initiatives are empowering extension professionals to guide farmers in making informed decisions regarding climate-related risks. Furthermore, the National Bank for Agriculture and Rural Development (NABARD) provides funding through the Adaptation Fund (AF) and Green Climate Fund (GCF) to support the implementation of climate-resilient agricultural projects.

Private sector companies are also contributing to climate-resilient agriculture through Corporate Social Responsibility (CSR) initiatives, which include watershed development, climate-smart community initiatives and the introduction of sustainable water and soil management practices. Social mobilization plays an essential role in these efforts with institutions like Farmers Producer Organizations, Self Help Groups and Commodity Groups facilitating adaptation efforts. Research institutions both public and private are actively developing climate-resilient technologies including drought-resistant crop varieties, improved seed and breed options and advanced agronomic practices.

India has gained considerable experience in the development and implementation of climate-smart agricultural practices, technologies and support systems. However, the effective utilization of these innovations relies heavily on the awareness and competence of extension professionals. To address this need, the National Institute of Agricultural Extension Management (MANAGE) under the Ministry of Agriculture and Farmers Welfare (MoA&FW), has established a Centre for Climate Change and Adaptation (CCA) to offer capacity-building programs for extension professionals across various agricultural and allied sectors. These trained professionals in turn, are expected to train farmers, helping them to adopt climate-smart agricultural practices and technologies.

In light of this, MANAGE proposes to conduct an International ITEC Training Program titled " Building Climate Resilient Agriculture: Lessons from Indian Experiences for Extension Professionals" designed to enhance the technical competencies of extension professionals engaged in climate change adaptation and mitigation within the agricultural sector in Asian and African Countries. The situation in most of the Asian and African Countries will be similar to India. Hence, the experiences gained in India will be relevant to them to take up appropriate climate action.

Aims and Learning Objectives

- To provide an overview of India's policies and programs aimed at mitigating and adapting to climate change risks.
- To build technical competence among extension professionals from ITEC countries in climate-resilient agricultural technologies, practices, and services.

- To expose delegates to research and development efforts related to climate-resilient agriculture and share field experiences from Indian farmers.

Course duration

- The duration of the course will be for two weeks duration.

Tentative Programme Schedule

Time	Particulars
Day 1	
9.30 am – 10:00 am	Registration
10.00 am – 10:30 am	Introduction and briefing about the program
10.30 am – 10:45 am	Online Pre-training Test and Discussion
10.45 am – 11:00 am	Tea Break
11:00 am – 01:00 pm	Training Need Assessment- Group activities
1:00 pm- 2:00 pm	Lunch
2:00 pm- 3:30 pm	Icebreaking – Interactive Session
3:30 pm- 3:45 pm	Tea Break
3:45 pm -5:15 pm	Climate change impact in Agriculture – Indian experiences and Policy Initiatives
5:30 pm	Close
Day 2	
09:00 – 09:30 am	Recap Session
09:30 am – 11:15 am	Institute visit – MANAGE Campus
11:15 am – 11:30 am	Tea Break
11.30 am- 1:00 pm	Formal Inauguration of the programme
1:00 pm- 2:00 pm	Lunch
2:00 pm – 3:30 pm	Impact of climate change and Next generation climate services for smart agriculture
3:30 pm- 3:45 pm	Tea break
3:45 pm- 5:15 pm	Climate Trend Analysis and Weather based Crop Insurance as Risk Mitigation Option
5:30 pm	Close
Day 3	

09:00 – 09:30 am	Recap Session
9:30 am- 10:15 am	Integrated Watershed Management
10:15 am– 10:45 am	Tea break
11:00 am- 12:30pm	Corruption free India for a developed nation
12:30 pm- 01.00 pm	Lunch
01.00 pm- 05:30 pm	Visit to CRIDA and NTR Garden
Day 4	
9:00 am- 9:30 am	Recap session
09:30 am– 11:15 am	Integrated Farming Systems (IFS) to Minimize the Climate Induced Risk with Discussion
11.15 am- 11.30 am	Tea Break
11.30 am- 01.00 pm	IFS and Soil Health Management – Visit to PJTSAU farm
01.00 pm- 02.0 0 pm	Lunch
02.00 pm- 03.30 pm	Role of Indian Meteorological Department (IMD) on Forewarning on Climate related Extreme Events
03.30 pm-03.45 pm	Tea Break
03.45 pm- 05:00 pm	Attributes of Agricultural Extension Professionals for Serving Farmers
05:00 pm – 05:30 pm	Back at Work Plan
05:30 pm	Close
Day 5	
09:00 – 09:30 am	Recap Session
09:30– 11:00 am	Protected cultivation as climate risk adaptation option
11:15 – 11:30 am	Tea Break
11:30 am – 1:30 pm	vertical farming as climate risk adaptation option
1:30 pm – 02:30 pm	Lunch
2:30 pm – 5:00 pm	Knowledge management for climate resilient agriculture
5:30 pm	Close
Day 6	
8:30 am- 5:30 pm	Study Tour – Historical places of Hyderabad (Museum, Char Minar)
Day 7	

9:00 am- 9:30 am	Recap session
09:30 am – 11:15 am	Climate-Resilience and Profitability of Smallholder Farming Systems -Experience of Project on Climate Resilient Agriculture (PoCRA)
11.15 am- 11.30 am	Tea Break
11.30 am- 01.00 pm	Weather based Agro Advisory Services
01.00 pm- 02.00 pm	Lunch
02.00 pm- 5:30 pm	Visit to agro-metrological observatory, PJTSAU, Hyderabad
05:30 pm	Close
Day 8	
8:30 am- 5:30 pm	Visit to Ramoji Film city
Day 9	
09:00 – 09:30 AM	Recap Session
09:30 AM to 01:00 PM	Integrated Pest Management Research activities related to bio pesticides and bio control agents- Visit to NIPHM
01.00 pm- 2:00 pm	Lunch
2:00 pm – 3:30 pm	Digital advisory services in agriculture- Experience of prosoil project
03.30 pm-03.45 pm	Tea break
03.45 pm- 05:15 pm	Adaptation and Mitigation options for building Climate Resilient Agriculture in India – Experience of National Innovations in Climate Resilient Agriculture (NICRA)
05:30 pm	Close
Day 10	
09:00 – 09:30 am	Recap Session
09:30 am – 11:15 am	Climate change research on plant protection and production
11:15 am -11:30 am	Tea Break
11:30 am - 01.00 pm	Digital Agriculture under changing climate scenario
01.00 pm- 02.00 pm	Lunch
02.00 pm- 5:15 pm	Climate change related research on mandated crops of ICRISAT in dry land ecosystem - Visit to ICRISAT

05:30pm	Close
Day 11	
8:00 am- 5:00 pm	Visit to progressive farmers field
	Cultural evening
Day 12	
9:00 am- 9:30 am	Recap session
09:30 am– 11:15 am	Organic Farming – A tool for climate change adaptation
11:15 am- 11:30 am	Tea break
11:30 am- 1:00 pm	Water Management Technologies for Climate Smart Agriculture
01.00 pm- 02.00 pm	Lunch
02:00 PM – 03:30 pm	Digital Technologies for climate resilient Agriculture with focus on precision water management
03.30 pm-03.45 pm	Tea break
03.45 pm- 05:30 pm	Back at work plan
Day 13	
08:00 am – 05:00 pm	Statue of Equality, Golconda Fort
Day 14	
09:30 am – 11:15 am	Post-Training Test
11.15 am- 11.30 am	Tea Break
11.30 am- 01.00 pm	Review and Feedback of the Training Program
01.00 pm- 02.00 pm	Lunch
02.00 pm- 03.45 pm	Valedictory Program and Certificate Awards
03.45 pm	Tea Break
5:30 pm	Close

Expected outcome/Deliverables

- At the end of the training course, the extension professionals are expected to acquire knowledge on various adaptation and mitigation strategies in agriculture and allied sectors to address the climate change risks.
- The delegates gain an insight into research and field activities related to climate resilient agriculture in India.

- The delegates will understand the extension support services required to prepare farmers to the changing climate scenario to enhance the coping capacity of farmers

Eligibility criteria

- The Officials from Public/ Private/ Civil Societies in Agriculture and allied sectors associated with climate action from ITEC countries.

Additional details to be filled:

Educational qualifications of candidates	Graduates and Post graduates in agricultural science and allied sectors preferably associated with climate change
Work experience (required) if any	Working experience for minimum 3 years is desired in Public/ Private/ Civil Societies in Agriculture and allied sectors preferably associated with climate change
Minimum age	30 years
Maximum age	55 years
Target Group (level of participants, target ministries or dept., etc.)	Middle level Officers from Agri and allied departments, Faculty from Agri and allied University, Officials from Civil Society Organisations, Farmer producer Company preferably associated with climate change
Number of days of local trips	9 visits (tentative)
Number of days for outstation trips	NIL
Number of nights for outstation trips	NIL
Places to be visited	Educational visits Agro-metrological observatory, Rajendranagar NIPHM, Rajendranager Visit to PJTSAU Farm, Rajendranager ICRISAT, Patencheru ICAR-CRIDA, Santoshnagar Visit to progressive farmers field

	Cultural/Heritage visits	Statue of Equality (Muchintal), Golconda Fort (Ibrahim bagh) Ramoji Film city (Abdullahpurmet) Museum (Darulshifa), Char Minar (Ghansi Bazaar), NTR Garden (Khairtabad)
Mode of transport		AC BUS
Transportation charges (approx.)		-
Accommodation charges, if hotel is required to be hired		NIL
Entry ticket charges (If any during tours and visits)		-

Course Director Details

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