



**Banaras Hindu University**



## DST- Mahamana Center of Excellence in Climate Change Research

*Center of excellence in climate change is established under Prime Minister's National Action Plan on Climate Change and as an inter-disciplinary, long-term research and capacity-building initiative.*

### **MCECCR**

#### Contact

#### **Prof. RK Mall**

DST-Mahamana Centre of Excellence in Climate Change Research  
Institute of Environment and Sustainable Development  
Banaras Hindu University  
Varanasi – 221005

[mceccr@bhu.ac.in](mailto:mceccr@bhu.ac.in)

## Objectives

- I. To understand model performance with respect to parameterization and validation of various climate models and constraining uncertainty
- II. To standardize the sector specific impact assessment models for agricultural crops, water and health.
- III. To quantify the impacts and vulnerability in water, agriculture and health due to climate variability and change.
- IV. To identify the associated socio-economic implications.
- V. To develop infrastructure facilities for climate research and a coherent multi-disciplinary problem-driven research group, manpower by strengthening teaching and training to build long-term scientific capacity and serve R&D needs.

## Partner Institutes

Institute of Medical Science  
Institute of Agricultural Science  
Institute of Science  
IIT - BHU  
Faculty of Social Science  
Faculty of Arts

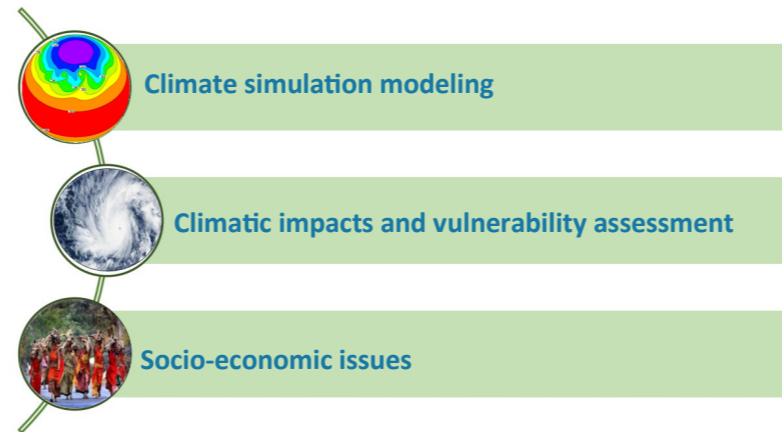
## Global Partners

IITs - Kanpur, Kharagpur, Delhi  
IITs - Bhubaneswar, Roorkee  
IARI - New Delhi  
IITM - Pune  
NIDM New Delhi  
IMD, NCMRWF  
JNU  
ICTP, Italy  
ANU, Australia  
Univ. of Florida, USA  
Purdue University  
NASA-JPL, AMES  
Technion IIT, Israel

## Approach and Methodologies

- Studying the role of aerosols on climate change.
- Understanding model performance with respect to parameterization and validation of various climate models and constraining uncertainty
- Modeling future climate under different developmental scenarios
- Evaluating agroecology and plant-microbe interactions under changing climate
- Standardization of sector specific impact assessment models for agricultural crops, water, health etc.
- Assessing climatic impacts and vulnerability in water, agriculture and health sectors
- Identifying associated socio-economic implications (e.g. water and food security etc.).
- Recommending climate resilient pathways for sustainable development

## Major thematic areas



## Focus areas

### Theme-1: Climate simulation modeling

**Role of aerosols on climate change** - Recognizing the uncertainty for improved climate modeling  
**Evaluation of Climate Models** - Understanding model performance and constraining uncertainty in climate models

### Theme-2: Climatic impacts and vulnerability assessment

Climatic impacts and vulnerability assessment in **water sector**  
Climatic impacts and vulnerability assessment in **agriculture sector**  
**Soil ecology and plant-microbe interactions** under climate change  
**Developing durable technology** for sustaining adverse impact of climatic change on the important crops and food security  
Climatic impacts and vulnerability assessment in **health sector**

### Theme-3: Socio-economic issues

**Community based management**  
**Economics of Climate Change**  
Climate Change and **Human Security**: Resilience and Response  
Water security, Food Security, Energy Security, Health security leading to **national security**

## Recent achievements

First Brainstorming session - February, 2017



WMO workshop on Piloting Climate Outlook Forums - May, 2017



WMO workshop on Piloting Climate Outlook Forums - May, 2017



## About MCECCR

The DST MCECCR was initiated at Banaras Hindu University, Varanasi in 2017 with the help of over 20 faculty participants drawn from different Institutes of BHU such as Institute of Science, Institute of Medical Sciences, Institute of Agricultural Sciences, Indian Institute of Technology (BHU) and Institute of Environment and Sustainable development.

The main goal of this initiative is to develop a holistic approach for solving climate change related problems and impact assessment.

## MCECCR mission

The main mission of the center is to develop fundamental understanding of the climate change and deducing its impact on the water, health and agricultural sectors from local to global scales.

## Mission statement

**Education:** To develop an inter-disciplinary curriculum, special courses for undergraduate, post-graduate doctoral students and to serve continuing education needs of professionals.

**Research:** To undertake high-impact, multi-disciplinary problem driven research for end-to-end solutions to climate change. To build long term scientific capacity and systems for study of regional climate change and climate futures.

**Human Resource Development:** To enable the creation of a pool of multi-disciplinary researchers to serve the growing need for climate change professionals.

**Government and Industry Interaction:** To provide critical assessments to support policy and Governmental decision making. To serve public and private sector entities catering to clean energy and climate advisories and ser-