GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION NO. 1285
TO BE ANSWERED ON 9TH FEBRUARY, 2022

MC4 SCHEME

1285. SHRI VISHNU DAYAL RAM:

Will the Minister of EARTH SCIENCES be pleased to state:

(a) the highlights of the Monsoon Convection, Clouds and Climate Change(MC4) scheme;
(b) whether the MC4 scheme has been successful in improving the climate models with respect to climate change;
(c) if so, the details thereof;
(d) whether the MC4 scheme has received any funding from the Government; and
(e) if so, the details thereof?

ANSWER
THE MINISTER OF STATE (INDEPENDENT CHARGE) FOR
MINISTRY OF SCIENCE AND TECHNOLOGY
AND EARTH SCIENCES
(DR. JITENDRA SINGH)

(a) The Monsoon Convection, Clouds and Climate Change (MC4) scheme aims to address the scientific grand challenges of quantifying the interactions among monsoon dynamics, clouds, aerosols, precipitation & water cycle under changing climate, which is essential for improved prediction of regional climatic variations and their impacts over South Asia in a warming world. This scheme has five targeted project components focusing on the scientific deliverables, and also allowing for cross-fertilization of innovative research ideas through interconnections among the individual project components. The five sub-components are (i)Centre for Climate Change Research (CCCR) (ii)Physics & Dynamics of Tropical Clouds (PDTC) (iii)Atmospheric Research Testbeds (ARTs) (iv)Metro Air Quality and Weather Service (MAQWS) (v)Climate Variability and decadal Prediction(CVP). All the sub-components of MC4 are interlinked although each component has specific objectives aimed at achieving the larger objective of MC4.

(b) Yes Sir.

(c) Under the MC4 scheme, an Earth System Model (ESM) was successfully developed and implemented by CCCR for studying long-term climate variability and human-induced climate change. This model known as the IITM-ESM is the first climate model from India that has contributed to:

a. The latest Intergovernmental Panel on Climate Change (IPCC) AR6 assessment released in August 2021.

b. National Climate Change Assessment Report, Ministry of Earth Sciences, Govt. of India.

The IITM-ESM includes the following improvements (i) radiatively balanced climate modeling framework required for investigating climate change (ii) improved simulation of the Indian summer monsoon (iii) realistic teleconnections of the Indian Monsoon with modes of climate variability like El Nino-Southern Oscillation (ENSO), Indian Ocean Dipole (IOD), Pacific Decadal Oscillation (PDO) (iv)realistic sea-ice distribution in the Arctic and Antarctic (v) interactive ocean biogeochemistry and an improved representation of deep ocean circulation known as the Atlantic Meridional Overturning Circulation (AMOC) (vi) capabilities for studying the human influence on climate through changes in the atmospheric greenhouse gases (GHG), aerosols, land-use and land-cover changes.

More than 2500 years of historical climate simulations and future climate projections were successfully completed using the IITM-ESM as part of the ***Coupled Model Intercomparison Project*** (CMIP6) experiments of the World Climate Research Programme (WCRP), WMO. The IITM-ESM CMIP6 outputs including future projection have been disseminated using ESGF data node at IITM, Pune.

(d) Yes.

(e) The budget for MC4 during 2021-2026 is Rs.185 Crores.

****