GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
RAJYA SABHA
UNSTARRED QUESTION NO. 2748
ANSWERED ON 19/12/2024

IMPACTS OF CLIMATE CHANGE ON WEATHER PATTERNS

2748. SHRI JOSE K. MANI:

Will the Minister of EARTH SCIENCES be pleased to state:

(a) the manner in which Government is preparing for the potential impacts of climate change on the country's weather patterns;
(b) the details of long-term studies or models developed to forecast extreme weather events due to global warming; and
(c) whether there is collaboration with international organizations to share data and expertise on climate resilience?

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

(a) The Government has taken due note of Climate Change across the country and is making several efforts to assess and minimize the impact of climate change. The multi-faceted approach is aimed at addressing the potential impacts of climate change on the country's weather patterns, focusing on adaptation, mitigation, and resilience-building.

Key initiatives include:

- National Action Plan on Climate Change (NAPCC): Launched in 2008, it outlines eight national missions that focus on promoting sustainable development while addressing climate change. These include missions on solar energy, energy efficiency, sustainable agriculture, and water conservation.
- State Action Plans: States have also developed their own climate action plan in line with the NAPCC, addressing region-specific vulnerabilities such as extreme weather events (floods, droughts) and shifting monsoon patterns.
- Disaster Management and Early Warning Systems: India has strengthened disaster preparedness through its National Disaster Management Authority (NDMA), which works closely with the India Meteorological Department (IMD) to minimize the impacts of extreme weather events (e.g., cyclones, heatwaves, floods).
- Climate-Resilient Agriculture: The Government has promoted climate-resilient agricultural practices, such as drought-resistant crops, improved water management, and changes in cropping patterns to adapt to shifting rainfall and temperature patterns.
- Renewable Energy Development: India is aggressively expanding renewable energy sources, particularly solar and wind, as part of its strategy to reduce greenhouse gas emissions and transition to a low-carbon economy.

- Water Conservation: With increasing concerns over water scarcity, the Government has initiated various programs like the Jal Jeevan Mission and National Water Mission to improve water management and ensure sustainable water use, especially in drought-prone regions.
- Policy and Financial Frameworks: The Government has also integrated climate change considerations into national policies and budgets, aligning with international climate agreements (e.g., the Paris Agreement). This includes setting emission reduction targets and focusing on climate financing for vulnerable sectors.

These efforts are aimed at reducing vulnerabilities and preparing the country for the diverse impacts of climate change, from altered monsoon patterns to more frequent extreme weather events.

(b) There has been a quantum increase in climate modeling research and climate science in India. Ministry of Earth Sciences (MoES) established the Centre for Climate Change Research (CCCR) at the Indian Institute of Tropical Meteorology, Pune, to conduct research studies related to the science of climate change.

For the first time, the CCCR has developed an Indigenous climate model, namely the IITM-Earth System Model (IITM-ESM), which provides reliable future projections of Indian monsoon rainfall and is used in addressing climate variability and change issues across the region. The model is the first from India to contribute to the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (IPCC-AR6). In addition, the CCCR has also led the Coordinated Regional Downscaling Experiment (CORDEX) for the South Asia region for generating high-resolution regional climate change projections, which are frequently utilized for assessments of the impacts of climate changes on different sectors.

Also, the Ministry of Earth Sciences (MoES), has recently published a Climate Change report titled "Assessment of Climate Change over the Indian Region". The report has assessed the impact of climate change across the country, covering all aspects of regional climate change, including the climatic extremes across India. The report is the first of its kind, and a comprehensive discussion has been made regarding the impact of human-induced global climate change on the regional climate and monsoon of the Indian subcontinent, adjoining the Indian Ocean and the Himalayas.

Apart from the above, IMD brought out the web-based online "Climate Hazard & Vulnerability Atlas of India," prepared for the thirteen most hazardous meteorological events, which cause extensive damages and economic, human, and animal losses. The climate Hazard and vulnerability atlas will help State Government authorities and Disaster Management Agencies plan and take appropriate action to tackle various extreme weather events.

(c) Yes. India is actively collaborating with a number of international organizations to share data, expertise, and resources on climate resilience, as well as to address the broader challenges posed by climate change. This collaboration is part of India's efforts to not only contribute to global climate action but also to enhance its own adaptive capacity.

****