

GOVERNMENT OF INDIA  
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

**LOK SABHA**  
**STARRED QUESTION NO. 378**  
TO BE ANSWERED ON 13-12-2019

**Study on Global Warming**

\*378. SHRI RAJIV PRATAP RUDY:

Will the Minister of ENVIRONMENT, FOREST AND CLIMATE CHANGE be pleased to state:

- (a) whether the Government has conducted or proposes to conduct a detailed study on global warming and depletion of sources of water as a result thereof;
- (b) if so, the details thereof and the technologies proposed to be used or being put into use to address the issue;
- (c) whether the Government has conducted any study on the impact of global warming on marine flora and fauna; and
- (d) if so, the details thereof?

**ANSWER**

**MINISTER FOR ENVIRONMENT, FOREST AND CLIMATE CHANGE**  
**(SHRI PRAKASH JAVADEKAR)**

(a) to (d): A Statement is laid on the Table of the House.

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**STATEMENT REFERRED TO IN REPLY TO PARTS (a) TO (d) OF THE LOK SABHA STARRED QUESTION NO. 378 BY SHRI RAJIV PRATAP RUDY REGARDING 'STUDY ON GLOBAL WARMING' DUE FOR REPLY ON 13-12-2019.**

(a) and (b): Non-climatic drivers such as water withdrawals; rate of economic development and urbanization; land use change or natural geomorphic changes, etc. challenge the sustainability of water resources. The fifth assessment report of the Intergovernmental Panel on Climate Change also noted that end to end attribution, from climate change to impacts on freshwater resources is not attempted in most studies. Attribution of observed changes in ground water level, storage or discharge to climate changes is also difficult owing to additional influences of non-climatic drivers. As part of the first and second National Communications submitted to United Nations Framework Convention on Climate Change (UNFCCC), the Ministry conducted studies on impact of climate change in India which are summarized in the 'Vulnerability Assessment and Adaptation' chapters.

Government of India, Ministry of Jal Shakti is implementing various programs and scheme on conservation of water resources in the Country. Jal Shakti Abhiyan has been launched, which is a time bound campaign, with a mission mode approach intended to improve water availability, including ground water conditions in the water stressed blocks of 256 districts in India. In this regard, teams of officers from Central Government along-with technical officers from Ministry of Jal Shakti were deputed to visit water stressed districts and to work in close collaboration with district level officials to undertake suitable interventions. National Hydrology Project is being implemented, with World Bank assistance to improve the extent, quality and accessibility of water resources information and to strengthen the capacity of water resources management institutions in India. This will ensure availability of reliable, real-time and continuous data for informed decision making. For this purpose, modern technologies like Lidar mapping, Real Time Data Acquisition System through telemetry, SCADA system for Water Resources management and advanced information technology based information system are being used.

(c) and (d) : As per the Special Report on 'The Ocean and Cryosphere in a Changing Climate' released in September 2019 by the Intergovernmental Panel on Climate Change (IPCC), since about 1950; many marine species across various groups have undergone shifts in geographical range and seasonal activities in response to ocean warming, sea ice change and biogeochemical changes, such as oxygen loss, to their habitats. This has resulted in shifts in species composition, abundance and biomass production of ecosystems, from the equator to the poles. However, in some marine ecosystems, species are impacted by both the effects of fishing and climate changes. The report also states that the coastal ecosystem are affected by ocean warming, including intensified marine heat waves, acidification, loss of oxygen, salinity intrusions and sea level rise, in combination with adverse effects from human activities on ocean and land.

Central Marine Fisheries Research Institute (CMFRI) has also been entrusted to carry out the climate change impact studies on Indian marine fisheries sector through multiple projects viz 'National network project on climate change' (2004-2007), 'National Innovations in Climate Resilient Agriculture' (NICRA) (2010-2020) funded by Indian Council of Agricultural Research

(ICAR), and the Ministry of Environment, Forest and Climate Change funded project entitled 'Impacts, Vulnerabilities and Adaptation Strategies for Marine Fisheries of India' (2017-2020). The preliminary investigations reveal strong correlations of sea surface temperature change with abundance of marine plankton species, fish eggs and larvae. The studies of marine fauna reveals that variations in oceanographic parameters- sea surface temperature, current speed, wind and rainfall, etc. do have influence on the food and feeding, maturity and spawning, distribution range, abundance and catch of several marine fish species.

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