

GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

LOK SABHA
UNSTARRED QUESTION NO. 4092
TO BE ANSWERED ON 28.03.2022

Effects of Global Warming on Maritime Flora and Fauna

4092. SHRI AJAY NISHAD
SHRI CHANDAN SINGH:

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

- (a) whether the Government has conducted or proposes to conduct any detailed study about global warming and erosion of water bodies as a result thereof;
- (b) if so, the details thereof and the technology being used or to be used to solve this issue; and
- (c) whether the Government has conducted any study in regard to the affect of global warming on maritime flora and fauna and if so, the details thereof?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE
(SHRI ASHWINI KUMAR CHOUBEY)

(a) and (b) Impact of climate change on water bodies is a dynamic process and quantum of this impact varies from time to time due to variable nature of climatic conditions. While country-wide assessment has not been performed to examine the impacts of climate change on soil erosion and sedimentation, there are studies conducted at the river basin scales in different regions of India that suggest an increase in soil erosion and sedimentation due to climate change. The observed and projected increase in erosion is mainly due to increase in heavy rainfall events and associated floods in the observed and projected future climate.

Further, various agencies of the Government of India undertake research and development studies on the effect of climate change on various dimensions of water from time to time depending upon the prevailing conditions gauging the systematic linkages between climate and water.

The National Hydrology Project is being implemented which has resulted in improved extent, quality and accessibility of water resources information and strengthened the capacity of water resources management institutions in India. For the implementation of this project, modern technologies like Lidar mapping, Real Time Data Acquisition System through telemetry, Supervisory control and data acquisition (SCADA) system for Water Resources management and advanced information technology-based information system were used.

The Central and State Governments take all possible steps for the preservation, conservation and management of water bodies (including lakes, wetlands etc.) in the country which inter-alia include Jal Shakti Abhiyan (JSA) started in 2019, a time bound campaign with a mission mode approach intended to improve water availability in the water stressed

blocks of 256 districts in India, Namami Gange Programme for conservation of river Ganga, notification of the Wetlands (Conservation and Management) Rules, 2017 for protection, conservation and management of wetlands, etc.

(c) 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 is 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.

As per information provided by the Indian Space Research Organization, a long-term study was carried out (1982-2018) on five major coral reef regions of India based on the modelled and satellite derived Sea Surface Temperatures (SST). The study found that Indian coral reef regions have different regional, thermal and bleaching thresholds corresponding to their individual warmest months and warmest quarters. A prototype coral bleaching alert system based on these regional thresholds has also been developed and hosted at VEDAS geoportal (vedas.sac.isro.gov.in).

Time series data on sea surface temperature and the abundance of green microscopic plants in the Exclusive Economic Zone (EEZ) of Arabian Sea and Bay of Bengal was obtained from satellite data during 2003-2019. Analysis long-term data showed a significant change in sea surface temperature since 2014. The southern area of Arabian Sea and Bay of Bengal showed sea surface temperature above the long term mean. The years 2015 and 2016, had the warmest sea surface temperatures in the region. Correspondingly, the production of green microscopic plants (estimated as concentration of chlorophyll - a pigment) as revealed from chlorophyll images decreased below the long term and was lowest during 2015-2016. These years also corresponded to the strongest El-Niño years of the decade.

Further, 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 reveal 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.
