GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION No. 181
TO BE ANSWERED ON FRIDAY JUNE 21, 2019

BIO-GEOCHEMICALAND BIOLOGICAL CHANGES

181. SHRI RAJESHBHAI CHUDASAMA:

Will the Minister of EARTH SCIENCES be pleased to state:

(a) whether Government proposes to conduct a thorough study on various aspects of bio-geochemical and biological changes of coastal seas of the country;
(b) if so, the details thereof and the objectives of the study along with the institutes involved in the study; and
(c) the remedial steps being taken by Government to check erosion, salt-ingress on marine-life, etc. on the country's seacoasts?

ANSWER
MINISTER FOR MINISTRY OF SCIENCE AND TECHNOLOGY AND MINISTRY OF EARTH SCIENCES
(DR.HARSH VARDHAN)

(a)&(b) The Ministry of Earth Sciences (MoES) has been implementing a project to study various aspects of biogeochemistry in the seas around India including the east and west coast of India for over decade. The Biogeochemistry is a multi-disciplinary subject that interacts with physical, chemical, biological and geological processes and reactions that govern the composition of and changes to the natural environment. A system, scientific and long-term study on biogeochemistry of the seas around India was launched by MoES in 2010 with the participation of a network of national scientific and academic institutions. There are 24 sub-projects under the program addressing various aspects of biogeochemical aspects. The participating agencies include National Institute of Oceanography (NIO), Goa, Physical Research Laboratory (PRL), Ahmedabad, Central Marine Living Resources, (CMLRE) Kochi, Central Marine Fishery Research Institute (CMFRI). Cochin University of Science and Technology (CUSAT), Kochi, Andhra University, Goa University, Mangalore University.The study contributes towards understanding climate change and marine biogeochemistry. This program envisaged collection of time-

series data both in the Open Ocean and estuarine/coastal waters of India. A set of 3 time-series observing stations were established on the west coast of India near Kochi, Condolim Goa and in the Arabian Sea. The various important parameters being monitored periodically include chlorophyll, pH, dissolved, oxygen, nutrients such as dissolved nitrogen (nitrate, Nitrite), phosphorus, organic and inorganic carbon, bacteria, temperature, and salinity etc., Considering the outcome of the project, a dedicated project has been launched for conducting systematic studies in the west coast of India viz., Marine Ecosystem Dynamics of eastern Arabian Sea(MEDAS). As part of this program, a total of 10 research cruises and three seasons' estuarine surveys totaling to around 320 field days have been undertaken between December 2017 and January 2019. These studies have contributed significantly towards understanding the biogeochemistry of the coastal seas of the west coast of India.

(c) **Towards periodical monitoring and assessment of erosion of the coast, a set of shoreline management maps on 1:25000 scale has been development for the entire coast of India, using remote sensing, field and mathematical modeling and GIS tools. A GIS based interactive database was created and 517 maps depicting cumulative shoreline changes for the years 1990-2016 were generated. The analysis of last 26 years data suggests that about 33%, 38% and 29% coast is eroding, accreting and is stable in nature respectively. A web based coastal service on shoreline change is developed to disseminate the information to all stakeholders. The Coastal Regulation Zone (CRZ-2011) was also issued in 2011 with a view to, ensure livelihood of coastal community, to protect and conserve coastal areas and to promote development through sustainable manner based on scientific principles. Besides, a beach restoration work has been carried at Puducherry andKadalurPeriyaKuppam, Tamil Nadu, which can be replicated by Ministry of Water Resources and State Govts.**

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