GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
**RAJYA SABHA**
**UNSTARRED QUESTION NO. - 2428**
ANSWERED ON – 24/03/2022

**INCREASE IN TEMPERATURE OF OCEAN SURFACE**

**2428. Shri Ripun Bora:**

**Will the Minister of EARTH SCIENCES be pleased to state:**

(a) whether it is a fact that marine heat waves (MHW) have increased temperatures over seas and oceans of the country and have increased significantly in the past few decades;
(b) whether it is also a fact that the year 2021 broke all previous records of ocean heat which worstly affected the Western Indian Ocean and Northern Bay of Bengal impacting the southwest monsoon over the Indian subcontinent; and
(c) if so, plan of action of Government to overcome the disruption in India's monsoon patterns and normalise the temperature of the ocean surface?

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

(a) Yes, Sir. In the recent decades tropical Indian Ocean has experienced a rapid increase in ocean warming with an average rise in Sea Surface Temperature (SST) of about $1^{o}C$ over the period of 1951-2015 at a rate of $0.15^{o}C$/decade. In addition, a recent study by the Indian Institute of Tropical Meteorology (IITM), an autonomous institute under the Ministry of Earth Sciences has investigated the marine heatwaves. The study shows that the western Indian Ocean had a total of 66 Marine Heat Wave (MHW) events while the Bay of Bengal had 94 events during 1982–2018.The western Indian Ocean region experienced a four-fold rise in marine heatwaves events (increasing at a rate of 1.5 events per decade) and the north Bay of Bengal experience a two-to-three fold rise (at a rate of 0.5 events per decade).

(b) In the year 2021, there were 6 marine heatwaves recorded in the western Indian Ocean over a period of 52 days. In the north Bay of Bengal, there were 4 marine heatwaves over a period of 32 days. These heatwaves did not break all previous records but were above normal. The western Indian Ocean heatwaves in 2021 were in the top four years in terms of the number of events.

(c) The monsoon forecast models used by the India Meteorological Department (IMD) incorporates the ocean surface temperatures as input data. These forecasts can be used for advance planning and disaster management.

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