GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION No. 2735
TO BE ANSWERED ON MARCH 06, 2020

EQUIPMENTS FOR OCEAN PREDICTION

2735. SHRI RAJAN VICHARE:

Will the Minister of EARTH SCIENCES be pleased to state:

(a)     whether the Government has launched effective equipments for the prediction of the situation of ocean and mapping of area with fishing potential; and

(b)     if so, the details thereof?

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

(a)     Yes Sir.

(b)     To improve the predictability of the oceanic conditions/state, several equipments have been deployed and maintained in the ocean under the Ocean Observation Network (OON) programme of the Ministry of Earth Sciences (MoES). Numerical models are used to predict the oceanic condition including the storm surge and tsunami. Data from the deployed equipments are used to evaluate the model performance and for fine-tuning the models to enhance the accuracies of forecasts. Observations are received at Indian National Centre for Ocean Information Services (INCOIS) in real-time via satellite links. Following are the details of various equipment/platforms deployed in the ocean:-

| Platforms | Details |
|---|---|
| Argo | 148 active Argo floats in the Indian Ocean. The Argo floats measure temperature and salinity of the water column. 38 floats also measure chlorophyll, dissolved oxygen, nitrate and optical backscatter in the water column. |
| Expendable Bathythermograph (XBT)/XCTD | XBT/XCTD transects are carried out along Chennai-Port Blair, Port Blair-Kolkata, Kochi-Lakshadweep and Kochi-Mauritius to measure the upper ocean thermal structure. |
| Equatorial Current Meter | 2 Moorings in the Equator, to measure ocean currents at different depths. |

| Coastal Accoustic Doppler Current Profiler (ADCP) | Moorings carrying ADCPs deployed at 18 locations along the coast to provide the currents in the water column. |
|---|---|
| Tsunami Buoys | 7 tsunami buoys are maintained to detect and monitor the Tsunami waves before they arrive at the coast. |
| Tide gauges | 36 tide gauges are maintained at the coasts of mainland and Islands to continuously monitor the changes in the sea level and to record storm surge and tsunami waves. |
| Wave Rider Buoys (WRB) | At 16 locations: Veraval, Versova, Rantagiri, Karwar, Kozhikode, Kollam, Kavaratti, Colachel, Tuticorin, Puducherry, Krishnapatnam, Visakhapatnam, Gopalpur, Digha, Port Blair, Seychelles to continuously measure the wave height and direction. |
| Ship-mounted Automatic Weather Stations (AWS) | AWS onboard 34 Vessels |
| INCOIS FLUX mooring | 1 mooring in the Bay of Bengal to measure the air sea fluxes. |

Regarding the mapping of fishing potential, INCOIS does not prepare such maps. However, INCOIS provides advisories on the potential locations of fish aggregation using remote sensing data derived from Indian and foreign satellites on a daily basis.

Further under the on-going MoES, India- National Oceanic and Atmospheric Administration(NOAA), USA collaboration, an equipment named "Continuous Underwater Fish-Eggs Sampler" (CUFES) has been fabricated and installed on-board the Fishery Oceanographic Research Vessel (FORV) Sagar Sampada in order to collect eggs and larvae of the pelagic organisms particularly fishes. The quantitative estimation of fish eggs and larvae using this equipment gives indirect indication of the possible fish spawning areas. The spawning areas are very dynamic as the suitable environmental conditions are bound to vary time to time depending upon sea conditions.

The FORV Sagar Sampada is also equipped with Acoustic measurement systems (Active sensors) specifically the EK60, for the biomass estimation of organisms of different sizes in the water column. The frequency of operation currently available are 38KHz, 120KHz, 200KHz, using which main targets of fishes like Myctophids, zoo-plankton and phytoplankton can be mapped or assessed.

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