

**GOVERNMENT OF INDIA  
MINISTRY OF EARTH SCIENCES  
LOK SABHA  
UNSTARRED QUESTION NO. 739  
TO BE ANSWERED ON WEDNESDAY, 7<sup>TH</sup> FEBRUARY, 2024**

**DEVELOPMENTS IN EARTH SCIENCES**

739. SHRI NAYAB SINGH:

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) the developments made in the field of Earth Sciences, especially in Atmospheric Observing Systems, Agrometeorological Advisory Service, etc. by the country since 2014;
- (b) whether the Government proposes to undertake deep ocean survey for deep sea mining and to promote blue economy; and
- (c) if so, the details thereof?

**ANSWER  
THE MINISTER OF EARTH SCIENCES  
(SHRI KIREN RIJJU)**

- (a) Significant developments have been made to improve the monitoring and forecasting of severe weather events through augmenting the observational network in the country that include the following since 2014:
  - 39 Doppler weather radars network in 2023 against 15 in 2014.
  - 1208 Automatic weather stations in 2023 against 675 in 2014.
  - 1382 Automatic rain gauges in 2023 against 1350 in 2014.
  - 35 High wind speed recorders in 2023 against 19 in 2014.
  - 56 Upper air observation systems in 2023 against 43 in 2014.
  - 23 Manual pilot balloon (PB) stations upgraded to global positioning system (GPS) based stations while there was no GPS based PB station in 2014.
  - 138 Runway visual ranges in 2023 against 20 in the year 2014 at different airports across the country.
  - 107 Digital current weather systemson frangible masts at airports across India in 2023 against 29 in 2014.
  - 8 Heliport weather observing systems (HAWOS) have been installed at various heliports across the country in 2023 while there was no HAWOS in 2014.
  - 5896 District-wise rainfall monitoring scheme stations in 2023 against 3955 in 2014.

Agro-meteorological advisory services (AAS) have been extended to the block level from district level since 2018. At present, AAS is provided to all the agriculturally important 700 districts and around 3100 blocks in the country.

(b) Yes Sir.

(c) The Ministry of Earth Sciences has launched the Deep Ocean Mission in 2021 to explore deep sea resources to support the blue economy and for sustainable harnessing of ocean resources. So far, an extensive survey and exploration work has been carried out in the Central Indian Ocean Basin for polymetallic nodules (Nickel, Cobalt, Copper and Manganese, etc.) and in Central and South West Indian ridges for hydrothermal sulphide (Copper, Zinc, etc.). This exploration has identified few promising locations of hydrothermal activity and sulphide mineralization zones in the area.

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