

By Speed Post

File No. MoES/29/27/2014-RTI
Government of India
Ministry of Earth Sciences

Prithvi Bhawan, IMD Campus,
Lodhi Road, New Delhi.
Dated - 10th March, 2014.

To

Shri Ashok S/o Shri Dhanpat,
C/o Shri Mai Lal, Advocate, Juka Cony,
Jhajjar-124103 (Haryana)

Subject:-Information sought by Shri Ashok S/o Shri Dhanpat, C/o Shri Mai Lal, Advocate, Juka Cony, Jhajjar-124103 (Haryana) under RTI Act. 2005.

Kindly refer to your RTI Application dated 27/01/2014 (received on 25/02/2014) under the RTI Act on the above mentioned subject.

2. The reply provided by the concerned officer vide their letter no nil dated 10/3/2014 of Ministry Earths Sciences, New Delhi is enclosed for necessary action.
3. An appeal, if any, against this reply may be made to the Appellate Authority of the Ministry, at the following address within 30 days of the receipt of the letter i.e. Shri M. K. Bansal, Director, (RTI), Ministry of Earth Sciences, Prithvi Bhawan, IMD Campus, Lodhi Road, New Delhi-110003.

Encl. As above.

Yours faithfully,



(B. K. Thakur)

Central Public Information Officer & Scientist 'C'
Tel. No. 24669535.

Copy for information to:-

1. Director, (RTI), MoES, New Delhi.
2. Dr. M. Sudhakar, Transparency Officer, MoES, New Delhi.
3. PPS to JS, MoES, New Delhi.
4. In Charge IT Section (Sh. Krishnan is requested to upload this reply on website)

Reference to OM No MoES/29/27/2014-RTI dated 25 February 2015 regarding information sought by Shri Ashok.

The major decisions/achievements of the Ministry of Earth Sciences are as follows:

Creation of Ministry of Earth Sciences

The Ministry of Earth Sciences has been formed in the year 2006 to look at planet earth as an entity.

Atmospheric and Ocean Services

Weather Forecasting: Global Forecast System (GFS T382/L64) for predicting critical parameters such as winds, temperature, humidity, and rainfall, with a spatial resolution of 35 km was made operational, incorporating Grid Point Statistical Interpolation (GSI) scheme for global data assimilation for the generation of global scale forecasts up to 7 days in advance.

Advanced Training School: Towards human resource development in the field of earth science, an Advanced Training School was established with self contained facilities for training and research at Pune. The main objective of the Centre is to create a large pool of trained and dedicated earth and earth system scientists with in-depth understanding and hands-on expertise on individual physical processes of the land, ocean, atmosphere, biosphere and cryosphere with special emphasis on climate modeling. The aim is to go beyond the conventional training on individual systems and address weather and climate as processes arising from interactions between the above component systems. The first batch of 20 students was inducted in August 2011 through a national selection process.

Indian Ocean Forecasting System (INDOFOS): The Indian Ocean Forecast System (INDOFOS) was upgraded with Regional Ocean Modeling System setup at 1/8th degree (i.e.-13km) on 21st March 2011. This up gradation has significantly improved the quality of the forecasts, particularly in the vertical temperature profiles and surface and subsurface currents. The system, at present, provides forecast on wave heights, wave direction, sea surface temperature (SST), surface currents, mixed layer depth (MLD) and depth of 20 degree C isotherm up to 5-7 days in advance.

Disaster Mitigation Support

Early Warning System for Tsunami: On October 12, 2011 a Pan-India mock drill exercise was successfully conducted as part of Tsunami warning System in coordination with 29 countries of Indian Ocean under the overall framework of Intergovernmental Oceanographic Commission of UNESCO program. With this exercise, the Indian Tsunami Warning System has been entrusted responsibility for operation of Indian Tsunami warning system as Regional Tsunami Service Provider by UNESCO. This centre had been recognized as a Regional Tsunami Service Provider (RTSP) for the Indian Ocean Region and started operation to the Indian Ocean Rim countries.

Ocean Technology & Resources

Remotely Operable Subsea In-situ Soil Tester (ROSI) had been developed and was tested at a water depth of 5462 m in the Central Indian Ocean Basin (CIOB) in October 2011. This test is a significant milestone in India's R&D efforts towards demonstration of mining of polymetallic nodules from the deep oceans.

Meteorological Services

District-level agro-meteorological advisory service: District-level agro-meteorological advisory service along with 5 days in advance district level weather forecast system, covering 550 districts, has been made operational for farmers from December 2010 in partnership with a number of Central Government Ministries and organizations, state level institutions, private agencies, NGOs, progressive farmers and media. About 25,00,000 lakhs farmers have subscribed for the information through mobile for planning their agricultural activities.

Modernization meteorological Services: A major modernization exercise has been undertaken in the India Meteorology Department. Strengthened Atmospheric Observing Systems through state-of-the-art technology (AWS, ARG, DWR, GPS sonde) with high bandwidth communication systems in support of data reception and forecast dissemination requirements. Systems (both hardware and software) for integrated real-time data analysis, probing, interpretation, visualization, multi-product overlays, forecast customization, etc., have been commissioned for rendering improved sectorial warning services of IMD. As a part of the program, the atmospheric observation systems have been strengthened by installation of over 950 systems in various part of the country for real-time monitoring meteorological parameters. Computation facilities have been substantially augmented by commission of a set of 4 high performance computing systems in various centres of the ministry which has a total combining capacity of 124 Tflops. As a part of the program, the Atmospheric Observation network has been augmented considerably including installation of over 7 Doppler Weather Radars in various cities viz., Delhi, Nagpur, Hyderabad, Lucknow, Patiala, Agartala, and Mumbai during the period as a part of Modernization of India Meteorological Department. The installation of DWRs has improved now casting in these cities. Besides, installation of over 533 AWS and 350 ARGS in various locations of the country.

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Metro-city weather Forecast: A location-specific weather and air quality forecast 24 hours in advance was provided successfully for the Commonwealth Games 2010 in National Capital Region, Delhi. The information including current and forecasted weather information as well as information on major gaseous pollutants namely ozone (O₃), oxides of Nitrogen (NO_x), Carbon monoxide (CO), Benzene and other hydrocarbons, particulate matters of 2 different sizes, viz. PM₁₀, PM_{2.5}, and Black carbon is based on 11 air-quality stations and 34 weather stations. Venue-specific now-cast and forecasts for all the stadiums were also issued during the Commonwealth Games using Doppler Weather RADAR.

The information was disseminated through LCD and LED displays and dynamic web page. Presently, the observing systems that were in the specific sports venues are being re-located at appropriate places covering the entire NCR region of Delhi.

Ocean Science and Information Services

Fisheries Advisories for identified Potential Fishing Zones (PFZ): A unique system of Fisheries Advisories based on identification of potential fishing zones (PFZ) using remote sensing technology has been made operational. A new Tuna fishery advisory on operational basis has been initiated. So far over 93 Electronic Display Boards have been installed for dissemination of the information.

A dedicated Ocean sat Satellite Ground Station was installed at INCOIS, Hyderabad for real time direct reception of satellite data at INCOIS for various operational Ocean Information Services.

Operation of Tuna Fishing advisory services for generation and dissemination of information to deep sea fishing industry.

Setup a Coral Bleaching Alert System (CABS) for providing bimonthly status on 5 major coral environments of India viz., Andaman Nicobar, Lakshadweep, Gulf of Mannar, Gulf of Kutch. This provides early signs on the coral environments that undergo thermal stress and possible bleaching.

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Disaster Mitigation Support

Early Warning System for Tsunami: A state-of-the-art Tsunami Warning System was set up, in September 2007 at INCOIS, Hyderabad has been recognized as a Regional Tsunami warning centre for the Indian Ocean countries. Performance related to cyclone warnings has been significantly improved due to implementation of high-resolution models and augmentation of capability to acquire atmospheric and ocean data. As a part of disaster warning services, the Coastal Vulnerability mapping Index (CVI) for both Andaman & Nicobar and Lakshadweep islands have been completed. The percentage improvement for 12h and 24h cyclone forecasts with respect to climatology and persistence forecast (CLIPER) achieved during 2010 is found to be 18.1% and 24.1%, respectively. This centre has been recognized as a

- 4 -

Regional Tsunami Service Provider (RTSP) for the Indian Ocean Region and started operation to the Indian Ocean Rim countries. On October 12, 2011 a Pan –India mock drill exercise was successfully conducted as part of Tsunami warning System in coordination with 29 countries of Indian Ocean under the overall framework of Intergovernmental Oceanographic Commission of UNESCO program. With this exercise, the Indian Tsunami Warning System established by the ministry at INCOIS Hyderabad has been entrusted responsibility for operation of Indian Tsunami warning system as Regional Tsunami Service Provider by UNESCO.

Polar Science & cryosphere

- **South Pole Expedition:** The First Scientific expedition was successfully accomplished to the South Pole on in November 2010. The team collected atmospheric aerosol data and drilled short ice cores from pole and surrounding area in extreme climatic conditions. The South Pole expedition team reached a position of 90°S and 0°W on 21st November. The team covered a total distance of almost 2240 km during their traverse to the South Pole. Several scientific expeditions were conducted enroute as well as at the South, comprised (i) Raising cores at regular spacing along the Maitri-South Pole (Amundsen-Scot station) traverse to study variability of snow chemistry, particulate matter, etc. (ii) GPR sections along traverse to understand bed rock topography and Sub surface-Ice structure. (iii) Study of glacial-geomorphological landforms along the plateau.
- **Third Station in Antarctic:** The first Scientific to the South Pole expedition will be launched for the first time. During the 29th Antarctic expedition concluded by March 2009, the studies accomplished in the Larsemann Hills area for setting up the Third Station in the Antarctic including transportation of heavy equipment (American Cran – MANTIS) of 4 tons.

Ocean Technology & Resources

Low Temperature Thermal Desalination (LTTD): Two more LTTD plants were commissioned in the islands of Lakshadweep one each at Minicoy and Agatti during March 2011 and August 2011 respectively. These plants have been contributing significantly to the drinking water needs of the local population of these islands. Using Waste Heat from Power Plants, NIOT demonstrated the LTTD technology by commissioning of a plant and produced fresh water at the first trial run at the North Chennai Power Plant on 22.2.2009. The capacity of these plants are 1 lakh liter per day. Six more plants in other islands of Lakshadweep one each at Amini, Chetlet, Kadamath, Kalpeni, Kiltan and Andrott will be set up through public-private partnership. Tenders have been finalized.

Mining Technology: The remotely operable submersible (ROSUB) was tested at 5289 m in the Indian Ocean which is land mark achievement for exploitation of resources. Soil tester was tested in the central Indian Ocean.

Delineation of Outer Limits of Continental Shelf under the provision of the United Nations Convention on Law of the Sea – 1982. In order to stake India's claim to the continental shelf by the prescribed dead line of the 12th May, 2009, a partial submission in pursuant to Article 76 of the 1982 UNCLOS towards the establishment of the outer limit of its continental shelf on 11th May, 2009, as per the decision of Cabinet.

Coastal Marine Ecology

A full fledged hatchery unit for the breeding and rearing of ornamental fishes was established at Agatti, Lakshadweep islands. Technology for the commercial production of 2 species of clown fishes, Hatchery technology for spat development of *Pinctada margaritifera* (Black-lip pearl oyster) have been perfected at the hatchery unit in the Andamans Islands. Field Research Station at Agatti island of Lakshadweep during March 2009 to develop the hatchery technology for the captive breeding of marine ornamental fishes and transfer this technology to the islanders. In 2010, the Centre for Marine Living Resources and Ecology (CMLRE) estimated for the first time fish potential in the Indian EEZ of 4.32 MSY (maximum sustainable yield), in the Indian EEZ using both satellite and insitu data.

Climate Change Science

The Ministry has set up a dedicated centre for Climate Change Research at Pune to address various scientific issues relating to climate change including impacts on sectors like health, agriculture and water. Long-term (multi-decadal) simulations of Monsoon are carried out using coupled ocean-atmospheric models upon the commissioning of the HPC system upgrade for climate change research.

Networking of Centres

Setting up of National Knowledge Network (NKN) connection to all the centres of MoES for effective communication and data transfer useful for various information services being render by the ministry. Operation of Telepresence in all the centres of MoES to improve communication among the various scientists of the ministry and other organizations located in respective cities. This has been effectively used for conducting various meetings, which has substantially reduced cost and time in hosting the various meeting.