

- (b) Total proposals received - 53
Total approved proposals - 08
Total rejected proposals - 45 (Some of the research proposals were not submitted under above programme)

(c) Yes the said proposal was received under the above call. However, as the proposal doesn't fall under the Paleo-climate program, it was not considered and the PI was informed accordingly with a suggestion to revise or submit the proposal under the relevant program.

- (d) Does not arise.

Remote sensing satellite based research projects

2757. DR. V. MAITREYAN: Will the Minister of EARTH SCIENCES be pleased to state:

- (a) whether Government has initiated any specific remote sensing satellite-based projects, in the National Institute of Ocean Technology (NIOT), Chennai;
- (b) if so, the details thereof and if not, the reasons therefor;
- (c) the total amount allocated in the last three years for the project;
- (d) whether Government has initiated any satellite-based project to predict occurrence of cyclones, earthquakes and Tsunami;
- (e) if so, the details thereof and if not, the reasons therefor; and
- (f) the steps taken by Government for effective search operations to trace missing persons during the cyclones?

THE MINISTER OF EARTH SCIENCES (DR. HARSH VARDHAN): (a) Yes, Sir.

(b) NIOT has already established ocean observation system comprising of ocean moored buoys, tide gauges, tsunami buoys etc in adjoining seas for making *in-situ* measurements of met-ocean data and transmission in real time through satellite connectivity.

(c) In this regard, ₹ 22 crore, ₹ 25 crore and ₹ 19.97 crore were allocated to NIOT for the year 2015-16, 2016-17 and 2017-18 respectively.

- (d) Yes, Sir.

(e) The data acquired from ocean observation system is received at Indian National Centre for Ocean Information Services (INCOIS), Hyderabad through satellite, based on which ocean state forecast and tsunami advisories are issued to fisherman communities and local authorities. Inputs are also provided to India Meteorological Department (IMD) to monitor cyclones.

(f) INCOIS has developed an App called SARAT (Search And Rescue Aid Tool) which can predict the search location in the sea up to 10 days.

Impact of pollution on production of foodgrains

2758. SHRI VIJAY PAL SINGH TOMAR: Will the Minister of ENVIRONMENT, FOREST AND CLIMATE CHANGE be pleased to state:

(a) whether due to impact of pollution, several species of living organisms are on the verge of extinction and if so, the details thereof;

(b) whether Government has made any assessment of impact of pollution on nutrient quality of foodgrains resulting in increase in cases of malnutrition among children;

(c) if so, the details thereof; and

(d) the corrective measures taken by Government to save living organisms from extinction and minimise the impact of pollution on production of foodgrains?

THE MINISTER OF STATE IN THE MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE (DR. MAHESH SHARMA): (a) Scientists estimate that globally the rate of extinction of species has increased several times the natural rate, largely because of a combination of factors such as habitat change, over-exploitation, invasive alien species, pollution and climate change.

(b) and (c) Air pollution is known to affect crops by the deposition of Suspended Particulate / Matter (SPM) on leaf surface, entry of gaseous air pollutants such as SO₂ and NO₂ into plants through stomata, and by lowering the light intensity on ground affecting the photosynthesis and, thereby hampering their physiological processes. Preliminary studies conducted at ICAR-Indian Agricultural Research Institute (IARI), New Delhi indicate that if the air pollution load on the crop is reduced by filtering them using filters and charcoal filters in the tunnels, the growth, yield and photosynthesis of crops such as wheat, barley and chickpea were enhanced significantly.