

Death toll due to heavy rains and associated flooding was 24. As many as 1,274 houses were also damaged in the affected districts. Crops spread across 5.25 lakh hectares got damaged or inundated due to heavy rains. The horticulture crops on 24,332 hectares also suffered severe damage. About 2,180 km. of R&B Roads, 3700 km. of Panchayat Raj Roads, 1,286 Medium and Major tanks, 18 minor irrigation tanks, 44 lift irrigation projects and 225 electrical sub-stations also suffered severe damage. As many as 427 Gram Panchayats and 47 municipalities were inundated by flood waters.

(b) Yes, Sir.

(e) Detailed warnings (25 bulletins in total) were issued by ESSO-IMD during the period of 28-30 November, 2012 to the Control Room of the Ministry of Home Affairs (MHA) and other designated authorities at Central and State/UT level (to the Governments of Tamil Nadu, Puducherry and Andhra Pradesh in this case) at least 72h. prior to landfall of cyclone-NILAM. In addition, the bulletins were sent through various visual and print media including e-mail, fax, SMS. The Area Cyclone Warning Centre of ESSO-IMD located at Chennai and Cyclone Warning Centre at Visakhapatnam issued user specific bulletins and briefings for fishermen, ports, ships, State disaster management agencies, media, Indian Navy, aviation authorities etc. A press conference was also held on 30th October afternoon at ESSO-IMD New Delhi to brief about the current status and forecast on cyclonic storm, NILAM. Accordingly, various timely emergency response actions were organized by National Disaster Response Force (NDRF) and other para-military/civil defence battalions/trained rescue teams that have contributed to the minimization of human casualties significantly.

(d) Does not arise.

Research on climate change at North Pole

†2539. SHRI DARSHAN SINGH YADAV: Will the Minister of EARTH SCIENCES be pleased to state:

(a) whether Government proposes to conduct research on climate change at North Pole;

(b) if so, the details thereof;

(c) the estimated expenditure likely to be incurred thereon;

†Original notice of the question was received in Hindi.

(d) whether any agreement has been signed with any other country in this regard; and

(e) if so, the details thereof?

THE MINISTER OF EARTH SCIENCES (SHRI S. JAIPAL REDDY): (a) No, Sir. However, India has set up its Arctic research station — **Himadri** at Spitsbergen, Svalbard, Norway in 2008, located as a part of the International Arctic Research Facility, Ny-Ålesund (one of the world's **northernmost settlements** at 78°55'N 11°56'E about 1200 km. south of the north pole), primarily to conduct coordinated research in (i) Geological mapping and allied earth science studies; (ii) Biogeochemistry of sea-ice ecosystems; (iii) Atmospheric Physics and Chemistry; (iv) Glaciological Studies; (v) Paleo-climatology etc.

(b) Does not arise.

(c) Does not arise.

(d) No, Sir.

(e) Does not arise.

Cloud seeding

2540. SHRI MOHD. ALI KHAN:

SHRIMATI T. RATNA BAI:

Will the Minister of EARTH SCIENCES be pleased to state:

(a) whether some States have planned cloud seeding to stem the crisis of shortage of rainfall; and

(b) if so, the details thereof and its status in each State, particularly in Andhra Pradesh?

THE MINISTER OF EARTH SCIENCES (SHRI S. JAIPAL REDDY): (a) Yes, Sir. However, as things stand today, artificial rain making techniques involving cloud seeding cannot be used for bringing rain clouds to rainfall deficit/drought areas. Such efforts can only induce potential pre-existing clouds, already passing over a given place, to produce rain only if organized weather modification intervention becomes successful.

(b) As of now, all cloud seeding programmes have always been carried out