

**GOVERNMENT OF INDIA
MINES
LOK SABHA**

UNSTARRED QUESTION NO:2733
ANSWERED ON:09.12.2011
STUDY BY GSI ON POST TSUNAMI DEVASTATION
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Will the Minister of MINES be pleased to state:

- (a) whether the Geological Survey of India (GSI) has conducted any study for the protection of lives and property of people living in coastal areas in the wake of tsunami caused by devastating earthquake in Indian Ocean on 26 December, 2004;
- (b) if so, the details thereof;
- (c) the funds provided to the GSI for the said purpose;
- (d) whether the GSI has taken help from the eminent experts of this field from across the world; and
- (e) if so, the details thereof ?

Answer

THE MINISTER OF STATE (INDEPENDENT CHARGE) FOR MINES (SHRI DINSHA PATEL)

(a): Yes, Madam. Geological Survey of India (GSI) has conducted many studies after the Tsunami caused by devastating earthquake in Indian Ocean on 26th December, 2004.

(b): GSI took immediate action as a sequel to the earthquake and resultant Tsunami. The details are as follows :

i. Geological Survey of India requested the State Government of West Bengal to initiate action for close monitoring of water level of coastal areas of Digha-. Shankarpur and Haldia port areas and the Hooghly River.

ii. GSI combed through the entire South Indian coast from Visakhapatnam to Cochin through Kanyakumari to make Tsunami damage assessment and to advice mitigation measures. Broadband Seismic Observatory of GSI at Jabalpur and Nagpur recorded the main shock and aftershock parameters.

iii. Necessary arrangements for deployment of scientific personnel in the affected areas were made promptly and work plan was formulated for installation of seismic and geodetic instruments in the Andaman- Nicobar Islands to monitor aftershocks and nature of deformation caused by the earthquake. A team was dispatched to study the macroseismic effects of earthquake in the Andaman Islands.

iv. Besides, few more teams were constituted to study the effects of tsunami (post-tsunami survey) in the coastal tract of Andhra Pradesh, Tamil Nadu and Kerala.

v. Pre and post event satellite imageries were studied to assess topographic and physiographic changes.

vi. As on today, GSI team is working in Andaman & Nicobar islands conducting Global Positioning System(GPS) survey in campaign mode for constraining ground deformation. The GPS stations are proposed to be re-occupied 2-3 times annually. GSI is also carrying out monitoring work in the tsunami affected areas.

(c): GSI carries out such work from its own Budget Outlay.

(d): Yes, Madam. GSI's work in the field of Earthquake and Tsunami related studies are as per the prevalent methodologies and technique adopted elsewhere in the world and hence, in undertaking such work the latest techniques and methods adopted in the advanced countries by the eminent experts are always consulted by the GSI scientists.

(e): The details are as follows :

(i) A joint Indo-Japan Workshop was held in March 2005 at NGRI, Hyderabad to discuss the various aspects related to tsunami. A number of areas (items) of common interest were identified along with possible participating organizations in India and Japan.

(ii) GSI has been identified as one of the lead agencies for a research item entitled Paleo-tsunami Deposits/ Paleo-seismology for Estimation of Recurrence History'. Scientists of active fault research center, Geological Survey of Japan/ National Institute of

Advanced Industrial Science and Technology (AIST) actively participated in the collaborative research. As a part of the collaborative programme, a four day conference at Tokyo, Japan was held during 14th - 17th December 2005 and the representative of GSI (Shri A.K. Ghosh Roy, Director, GSI, ER, Kofkata) in the Conference presented the post-Tsunami work carried out by GSI in Andaman and Nicobar islands and also participated in the discussions amongst the scientists of India and Japan on the collaborative work.

(iii) A joint field survey in Andaman Islands was carried out during 12th to 21st March 2006. Two scientists of GSI participated in the field studies along with researchers from NT, Kanpur; University of Tokyo and Geological Survey of Japan.

(iv) Areas of common interest of GSI in Indo-Japan collaborative work related to tsunami were identified as follows:

i Combination of Global Positioning System [GPS] Buoys and tide gauge for numerical modeling for tsunami

ii. Post-seismic deformation studies (Joint analysis of acquired data)

iii. Paleo-tsunami deposits/ paleoseismology for estimation of recurrence history

iv. Rupture propagation modeling using seismological data

(v) Geological Survey of India also participated in the Conference on the `Earthquake of Sumatra of 26th December 2004 and the Indo-Australia Subduction` held during 22nd to 29th March 2006 at College de France, Paris.