GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
STARRED QUESTION NO. *343
TO BE ANSWERED ON FRIDAY, MARCH 19, 2021

LANDSLIDE SUSCEPTIBILITY MAPPING

***343: SHRI P.R. NATARAJAN**

Will the Minister of EARTH SCIENCES be pleased to state:

(a) Whether the Government is having any data on the number of incidents of landslips/landslides occurred during the last three years;
(b) if so, the details thereof, State/UT-wise;
(c) whether the State Governments/UTs maintaining/having National Landslide Susceptibility Mapping (NLSM) in the respective State/UT and maintaining
(d) if so, details thereof?

ANSWER
MINISTER FOR MINISTRY OF SCIENCE AND TECHNOLOGY AND MINISTRY OF EARTH SCIENCES
(DR. HARSH VARDHAN)

(a) to (d): A statement is laid on the Table of the House.

STATEMENT LAID ON THE TABLE OF THE LOK SABHA IN REPLY TO PARTS (a) to (d) TO THE STARRED QUESTION NO. *343(3RD Position) REGARDING LANDSLIDE SUSCEPTIBILITY MAPPING TO BE ANSWERED ON FRIDAY, MARCH 19, 2021.

(a) Yes Sir. Geological Survey of India (GSI) has collected data of 3656 nos. of major landslides that occurred during the last five years in different States/ UT, which have impacted lives and/ or infrastructure. These landslide data were collected by GSI through onsite field investigations under the Post-Disaster Studies programme taken up annually by GSI in all the landslide prone States/ UT as per GSI's Standard Operating Procedure, mainly in response to the requests received from the concerned State Governments.

(b) The state-wise details of 3656 major landslide incidences, collected so far have been tabulated below. For all these landslides, during field validation, GSI collected vital preliminary geoparametric attributes for each of the landslides, including studying its impacts, future vulnerability, and indicating the requirements for future detailed geoscientific investigations, if any. All the above data are also used for updating GSI's existing national landslide inventory.

Landslides occurred and studied during the period 2014-2020	
State Name	**Number of landslides**
Arunachal Pradesh	33
Assam	120
Meghalaya	32
Mizoram	14
Tripura	10
Manipur	20
Nagaland	34
Sikkim	20
Himachal Pradesh	97
Jammu & Kashmir (UT)	169
Uttarakhand	27
Karnataka	194
Tamil Nadu	196

Kerala	2238
Maharashtra	78
West Bengal	374
Total	**3656**

(c) **– (d)** The National Landslide Susceptibility Mapping (NLSM) project was launched by GSI after the 2013 Uttarakhand disaster as per the directive of the Technical Advisory committee (TAC). With the NLSM mapping, GSI has prepared 1: 50,000 scale landslide susceptibility map of 85% of the total target area (3.63 lakh sq. km. out of 4.2 lakh sq. km.) in different landslide prone States/ UTs. The work for the remaining area in Arunachal Pradesh is under execution and will be completed by Field Station (FS) 2021-22. During NLSM, GSI also collected historical information on **61287** nos. of landslides polygons using both Remote Sensing (RS) and field-based source data, out of which, **28831** landslides have already been field validated by GSI (Annexure-I). This huge historical national landslide inventory is continuously being updated with the new landslide data collected year-wise as part of Post-disaster studies. Landslide Susceptibility Mapping is a specific multi-thematic geoscientific mapping exercise, carried out primarily by the specialised technical resources of Geological Survey of India. In this geoscientific endeavour, the State Government has no specific role in mapping, other than reporting information of any new landslide incidence impacting lives and infrastructure, if any to GSI. While preparing the landslide susceptibility maps and updating the national landslide inventory, GSI duly considers those landslide occurrences too that are reported by any State Government.

The Geographic Information System (GIS) enabled NLSM outputs – the landslide susceptibility and national landslide inventory map are already shared through Web Map Service (WMS) with NDMA, with a request to share such vital geo-data with all the landslide prone States/ UTs and other relevant stakeholders, for integrating the same in their respective landslide disaster management plans, and also for using in land-use zoning regulations in their respective landslide prone terrains. The above geo-data is also uploaded in GSI's Bhukosh map portal (https://bhukosh.gsi.gov.in/Bhukosh/MapViewer.aspx) as "NLSM" and "Landslide Inventory" map services for free downloading by any stakeholder. Till date, 753 registered non-GSI users from 412 different affiliations have so far downloaded the above vital landslide geodata by raising 7118 different online requests to GSI in Bhukosh. In addition, the NLSM outputs also delineates the critical and problematic areas, where further up-scaled and detailed geoscientific studies are required for undertaking site specific effective remediation and mitigation by the concerned State Governments and other relevant stakeholders (e.g., road/ rail construction and maintenance authorities).

ANNEXURE-I

Status National Landslide Susceptibility Mapping (NLSM) Programme 2014-2020				
State/ UT	**Target area proposed (km^2)**	**Target area completed so far (km^2)**	**Landslide polygons mapped (Nos.)**	**Landslides field validated (Nos.)**
Assam	24100	24144	527	598
Meghalaya	22020	22601	1525	791
Mizoram	21040	21864	4221	2003
Tripura	1300	1367	57	56
Manipur	22500	23250	2405	1548
Nagaland	16320	17294	2742	1554
Sikkim	4980	4979	3379	651
Himachal Pradesh	42100	42108	17127	6420
Jammu & Kashmir (UT)	28700	28890	7465	2174
Ladakh (UT)	40000	40065	838	166
Uttarakhand	39000	39009	14782	4927
Karnataka	30620	31323	1248	1278
Goa	3540	3546	76	76
Tamil Nadu	10080	10549	782	863
Kerala	19330	19301	1396	3016
Andhra Pradesh	1150	1124	29	29
Maharashtra	28190	29191	1134	1152
West Bengal	2970	2980	1554	1529
Arunachal Pradesh	71210	Work initiated in FS 2020-21 and scheduled to be completed by FS 2021-22.		
Total	**429150**	**363585**	**61287**	**28831**

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