

**GOVERNMENT OF INDIA
MINES
LOK SABHA**

UNSTARRED QUESTION NO:4300
ANSWERED ON:04.08.2009
CRACKS ON THE GROUND
Kumar Shri Shailendra

Will the Minister of MINES be pleased to state:

- (a) whether the Government is aware about the cracks that have been appearing on the ground in various parts of North India;
- (b) if so, the details thereof ;
- (c) whether Geologists and the Geological Survey of India (GSI) has conducted any study in this regard;
- (d) if so, whether they have submitted their report to the Government;
- (e) if so, the details of the report;
- (f) whether any special advisory has been issued for such areas by the Geologists/GSI; and
- (g) if so, the details thereof ?

Answer

THE MINISTER OF MINES AND MINISTER OF DEVELOPMENT OF NORTH EASTERN REGION (SHRI B.K. HANDIQUE)

(a) & (b): Yes, Sir. The Geological Survey of India (GSI) has received reports about cracks that have been appearing on the ground in various parts of North India. Ground fissures were reported from parts of the Gangetic plain in Chhibramau, Nawabganj, Kamlaganj and Kannauj of Farrukhabad district, Uttar Pradesh during June-July 1995. Ground cracks were also reported from Baripal village of Kanpur Dehat, Malkhanpur village of Allahabad and Anegpur and Sonepur villages of Sant Ravidas Nagar (Bhadohi) during June-July 2006. Ground cracks were reported during June-July, 2008 in parts of Uttar Pradesh in Hamirpur, Banda, Jalaun, Allahabad, Etawah and Raebareli and in Lucknow.

(c) & (d): Yes, Sir. In 2008, a team from GSI visited Hamirpur, Mahoba, Etawah and Jalaun districts and have gathered information about ground cracks and fissures at Kupra, Puraini, Parcha, Riwan, Khandeh, Sikrodhi, Surajpur and Chaura Devi Temple villages in Hamirpur district; Khanna village in Mahoba district; Garhi Mangat, Sindaus, Hanumantpura and Basaiyahaar villages in Etawah district and Rampura and Kalpi villages in district Jalaun. GSI has submitted interim reports on studies carried out in parts of Hamirpur, Banda, Allahabad, Etawah, Raibareli and Lucknow districts of Uttar Pradesh. The information along with relevant photographs is available on GSI's Portal (www.portal.gsi.gov.in).

(e),(f) & (g): Yes, Sir. The ground fissures vary from a few meters to a kilometer in length, 0.30m to 2.0m in depth and 0.15m to 1.5m in width. The cracks have widened because of subsequent collapse of the edges of the walls leading to increase in their aperture. The cracks are generally curvilinear and discontinuous in nature and have reticulate pattern at places. They are developed in the topsoil comprising silty clay and clay. A few thin kanker horizons are also present in major clay horizons, particularly in ravinous areas. The areas where the cracks are developed are generally flat ground except in a few locations where the area is slightly undulating like Kupra in Hamirpur district, Garhi Mangat, Sindaus and Hanumantpura in Etawah district and Rampura in Jalaun District. All cracks are either in the vicinity of some stream or some water body like ponds. The areas had been experiencing deficient rainfall for the last 4 to 5 years and there had been excessive withdrawal of ground water through tube wells and motor operated wells for domestic and irrigation purposes. All the cracks were developed and noticed after the first heavy rains in the area of the season. The probable mechanism for the development of the ground fissures may be attributed to excessive drying of the soil mass due to drought conditions for the last 4 to 5 years in the area, excessive withdrawal of ground water, sudden over saturation of soil mass due to heavy precipitation in a short duration and loss of subsurface fines through piping.

Drought conditions for the last 4 to 5 years and extensive withdrawal of ground water in Bundelkhand and adjoining regions of Uttar Pradesh has resulted in excessive drying of soil which led to tensile failure brought about by shrinkage. The tension failure occurred near the surface and gave rise to more or less vertical cracking. The ingress of water during heavy precipitation increased the pore pressure in the clay, which in turn resulted in overall reduction of strength of clay and attributed to the development of ground fissures. No neotectonic activity has been noted in the area.

As a mitigation measure, it has been suggested that recharge of the groundwater should be taken up on priority basis by formulating a comprehensive plan for ground water harvesting and water management in the region. Special advisories have also been issued for such areas by GSI to the district authorities with the suggestion to keep a check / strict vigil and monitor the cracks and inform the GSI

and other authorities immediately.