

Preliminary Note on Delhi Earthquake of 26 November 2007

(Sent by Dr. Y. P. Sharda, Director, Landslide Hazard Information Management & Engineering Project Evaluation Division, Geological Survey of India, New Delhi on 26.11.2007)

The tremors were widely felt in Delhi as well as neighbouring towns of NOIDA, Gurgaon and Faridabad on Uttar Pradesh and Haryana. People in general at all the places felt shaking accompanied by rumbling sound. People sleeping were woken up by the tremors and many reported shaking of beds. People felt scared in general and came out in open even during chilly winter morning. The undersigned sitting on a sofa heard rumbling sound and felt sofa. Other members of family woke up in panic as they also heard rumbling sound and felt shaking of beds. The effect of tremor was felt more on upper floors than at lower ones. Many people in Vasantkunj, Noida, and Indraprastha Extension reported to have observed shaking of objects, knocking sound from doors and windows. People in Gurgaon observed shaking of doors as well as front gates.

No damages done to this event has been reported so far.

It appears that maximum intensity due to this earthquake was V on MM scale.

A Note on Delhi Earthquake of 26 November 2007

(Sent by Shri Prabhas Pande, Director, Earthquake Geology Division, Geological Survey of India, Northern Region, Lucknow on 27.11.2007)

An earthquake of slight magnitude jolted the National Capital Region (NCR) and surrounding areas in the early hours of 26 November 2007. The tremors were strong enough to cause lot of consternation among people residing in a radius of about 60 km from Delhi. The India Meteorological Department (IMD) gave the following parameters of the earthquake.

Magnitude (Richter): 4.3

Epicenter: 28.6° N: 77.0° E (Near Bahadurgarh, Delhi-Haryana Border)

Date-Time: 26 November 2007 – 4 hrs 43 min (IST)

The USGS has given the following parameters of the event

Magnitude (Mb): 4.6

Epicentre: 28.677° N: 77.204° E (within New Delhi)

Date-Time: 25 November 2007 – 23:12:17 hrs (UTC) or 04:42:17 hrs (IST)

Depth: 10 km (set by location programme)

The IMD has, so far, not recorded any aftershock in the region, nor has any been felt after the 26 November event. The perceptions of the tremors, as recorded from different localities, are given as follows.

Delhi Area

In the entire urban agglomeration of Delhi, the tremors were widely felt. Many awakened from deep sleep and there was some panic and anxiety. The tremors, lasting for 4-5 seconds only, were accompanied by a rumbling sound. The general observation includes rocking of bed and hanging objects, barking of dogs and chirping of birds. Many people, particularly those from higher storey, came out in the open. Widening of some preexisting cracks reported in stray cases but no damage to structures as such, observed.

Faridabad

The tremors were widely felt and many awakened from sleep. There was lot of inquisitiveness and some amount of anxiety among the residents some of whom came out of their buildings. In some cases, widening of preexisting cracks reported.

Gurgaon

The effect of the tremors was more distinct at Gurgaon. Most of the people inhabiting multi-storeyed apartments rushed out in the open out of panic. Fall of objects not reported even from upper floors.

Meerut

The tremors distinctly felt and many awakened. No damage reported.

Chandigarh

The tremors had a feeble intensity at Chandigarh and so remained largely unnoticed. Only in stray cases, some very sensitive people felt the perturbations.

Lucknow

The tremors not felt at all even by those who were fully awake and in stationary position.

Analysing the data obtained from different localities, the maximum intensity of the earthquake appears to be of the order of V on MSK-64 Intensity scale, encompassing areas south of Delhi and Gurgaon. Intensity IV appears to extend up to Meerut and includes places like Ghaziabad, Faridabad, West and North Delhi, etc. Chandigarh, located 200 km north of Delhi, seems to have been in intensity II.

The National Capital Region is located between Mahendragarh-Dehradun fault in the west and Great Boundary fault in the east, at the junction of Aravalli Delhi fold belt and Indo-Gangetic foredeep. A few faults / lineaments of seismogenic nature have been inferred dissecting the fold belt. Three earthquakes of $M \geq 4$ had their epicenter located in this region prior to the event of 26 November 2007. These were (i) Delhi earthquake of 15 July 1720 of epicentral intensity IX, in which some 1000 people perished, (ii) earthquake of 27 August 1960 of M 6.0 (Io VII) and (iii) earthquake of 28 July 1994 of M 4.0 (Io V). The Bulandshahar earthquake of 10 October 1956 of M 6.5 and Moradabad earthquake of 15 August 1966 of M 5.6 had considerable effect in the NCR. Some of the damaging earthquakes originating in the Northwest Himalaya also affected the region. The Seismic Zone map of India, therefore, categorises NCR in Zone IV that is of High Hazard category.