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The Bunia (DRC-Uganda) Earthquake sequence of 2-3 July 2013 and its implication to seismic hazard assessment in the Lake Albert region

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The Bunia earthquake sequence commenced on July 02, 2013 with an earthquake of magnitude 5,1 at 13:33 (UT). The main shock with magnitude about M=5.7 occurred on July 03, 2013 at 19:21 (UT). It was followed by the largest aftershock of magnitude M=5.1 at 22:22 (UT). These tremors were felt strongly mainly in Bunia (DRC) and Hoima (Uganda), distant from epicenter , respectively, at about 55 km and 67 km; according to the European-Mediterranean Seismological Center, and GFZ-Geofon program . This repeated occurrence was worrying. However, based on old events observed in the West rift Zone, such as the Karonga earthquake sequence in Malawi where main shock occurred on 20 December 2009, this earthquake sequence is a natural phenomena associated with active faulting on the West flank of the East Africa Rift.

The focal mechanism of these three moderate events provided by GFZ-Geofon program show normal faulting with probable nodal fault plane having the north-northeast orientation in agreement with the orientation of the rift axis in the region. Stress drop calculated for these events varied from 3 to 13 bars,

There is no relationship between the Bunia earthquake sequence and the result of intensified oil and gas exploration activities in the Lake Albert region.

Normally a 5.7 quake magnitude is capable of considerable damage, especially in build-up area, however no major incidents were reported in the Lake Albert Region. Little damage was observed but this event raises concern about the quake-prone country's preparedness in the event of major seismic activity in the country. Population in Bunia City is estimated to about 76000 inhabitants and will become soon the capital of Ituri province. With the increase of population and build up infrastructures, the seismic risk will increase.

Seismic hazard assessment in the study area shows that the nominal peak ground acceleration value for a return period of 475 years equals or exceed 0.1 g. Therefore, it is recommended that structures be designed for seismic load in that area.