

Accepted Manuscript

Seismotectonics and Seismogenesis of Mw7.8 Gorkha Earthquake and its Aftershocks

B.R. Arora, B.K. Bansal, Sanjay K. Prajapati, Anup K. Sutar, Shailesh Nayak

PII: S1367-9120(16)30231-0

DOI: <http://dx.doi.org/10.1016/j.jseaes.2016.07.018>

Reference: JAES 2763

To appear in: *Journal of Asian Earth Sciences*

Received Date: 5 November 2015

Revised Date: 18 July 2016

Accepted Date: 20 July 2016



Please cite this article as: Arora, B.R., Bansal, B.K., Prajapati, S.K., Sutar, A.K., Nayak, S., Seismotectonics and Seismogenesis of Mw7.8 Gorkha Earthquake and its Aftershocks, *Journal of Asian Earth Sciences* (2016), doi: <http://dx.doi.org/10.1016/j.jseaes.2016.07.018>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Seismotectonics and Seismogenesis of Mw7.8 Gorkha Earthquake and its Aftershocks

B. R. Arora^{1,*}, B. K. Bansal¹, Sanjay K. Prajapati², Anup K. Sutar¹ and Shailesh Nayak¹

¹ Ministry of Earth Sciences, Prithvi Bhavan, Lodhi Road, New Delhi-110003

²National Center for Seismology, Ministry of Earth Sciences,

Mausam Bhavan, New Delhi-110003

*Corresponding author: *Email: arorabr47@gmail.com*

Abstract:

The April 25, 2015, Mw7.8 Gorkha Earthquake in central Nepal was followed by intense aftershock activity, including Mw6.7 shock on April 26, 2015 and Mw 7.3 shock on May 12, 2015. Synthesis of the focal mechanisms, space-time distribution of seismic activity in relation to previously imaged crustal velocity and resistivity structures reveals focusing of the Mw7.8 Gorkha earthquake near the upper surface of the thin fluid-filled low velocity and high conducting layer immediately above the plane of the detachment. On the geophysical sections, the detachment is identified as a sharp positive velocity interface. Modulation of frictional coupling and mechanical weakening by high-pore pressure fluids counteract the arc-normal stresses creating conditions for failure and nucleation of the Gorkha earthquakes on a plane sub-parallel with the detachment. Spatio-temporal patterns in aftershock activity indicate rapid alteration of main shock-induced stress fields, triggering a strong aftershock of Mw 6.7. Large stress drop and increased energy released by the Mw6.7 event facilitates upward injection of high pore-pressure fluid fluxes into the hidden out-of-sequence thrust. It is suggested that

Download English Version:

<https://daneshyari.com/en/article/5786083>

Download Persian Version:

<https://daneshyari.com/article/5786083>

[Daneshyari.com](https://daneshyari.com)