

Paper Number: 319

Seismic landslide hazards mapping: A case study in the Yingxiu area, Sichuan, China

Ge Hua¹ and Chen Qiguo¹

¹Chengdu Center, China Geological Survey, Chengdu 610081, China, e-mail: gehua_cdcgs@qq.com

Although there is controversy concerning the problem whether the earth has entered into the earthquake-prone period or not, it is generally accepted that the frequency of the recent devastating earthquake is higher than that in the past. Earthquake-induced landslides are increasingly becoming the research focus of geologists. After a regional long-term earthquake prediction, it has great significance for reducing casualties and property losses if we can predict the earthquake-induced landslide prone area as well as assess the seismic landslide hazards. In this paper, the commonly used seismic landslide hazard evaluation methods are presented. As an example, the seismic landslide hazards mapping and analysis is applied for Yingxiu area, the epicentral area of the Wenchuan M_s 8.0 earthquake on May 12, 2008, by using calibrated Newmark model. The main conclusions of the mapping and analysis are as 1) the dominated seismic geohazards within Yingxiu area are shallow, disrupted landslides and small scale rockfall and clustered in the hanging wall of the Longmenshan Central fault; 2) several deep-seated landslides or rock avalanches with long run-out located near or at the Longmenshan Central fault ruptures; 3) the seismic geohazards evolution in Yingxiu area are probably controlled by the earthquake magnitude, the rugged topography and fragile lithology; 4) the man-made steep slopes, such as slope-cut in order to build road or house, can be severely damaged during this Wenchuan earthquake and formed rockfall or landslide; 5) the Wenchuan earthquake disturbs the slope bedrock and creates an amount of loose material on the slopes. It affects the stability of these slopes for a long period of time and attention needs to be paid to prevent the secondary hazards such as debris flow after the earthquake.

Keywords: Earthquake-induced landslides; Hazard assessment; Hazard Mapping; Wenchuan earthquake

References:

- [1] Newmark N M (1965). Effects of earthquakes on dams and embankments. *Geotechnique* 15(2): 139-160.
- [2] Keefer D.K. (2002) Investigating Landslides Caused by Earthquakes—A Historical Review. *Surveys in Geophysics* 23(6): 473-510.
- [3] Dai F C et al. (2011) Spatial distribution of landslides triggered by the 2008 Ms 8.0 Wenchuan earthquake, China. *Journal of Asian Earth Sciences* 40: 883-895.
- [4] Jibson R W, Harp E L, Michael J.A. (2000) A method for producing digital probabilistic seismic landslide. *Eng Geol* 58: 271-289.
- [5] Jibson R W. (2007) Regression methods for estimating coseismic landslide displacement. *Eng Geol* 90: 209-218.

