Factors Controlling the Spatial Distribution of Coseismic Landslides Triggered by Ludian Earthquake

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Abstract: Understanding the spatial distribution regularity of coseismic landslides is important for mitigation in future earthquakes. Unveiling the controlling factors of the distribution of coseismic landslides is a long-standing unsolved problem. On 3 August 2014, a *Mw* 6.1 earthquake occurred in Ludian County, Yunnan Province, China, and resulted in a great number of landslides and substantial losses. This work conducted a spatial analysis to reveal the controlling factors in the Ludian earthquake. A total of 1,414 landslides were identified after a combination of image interpretation and field investigation in an area of 704.7 km^2. A geographic information system (GIS) was used to analyse the spatial characterization of the landslides. Correlations between the occurrences of landslides and factors were characterized with a spatial analysis in GIS. It can be concluded that the slope gradient and the distance to the coseismic fault are the two most important factors for determining the spatial distribution of coseismic disasters. Some other factors play a role by influencing the slope gradient to a certain extent, and the movement of the coseismic fault is the prone direction of coseismic landslides. Slope cutting fractures the rock mass, increases the slope gradient, and significantly increases the occurrence of coseismic landslides.

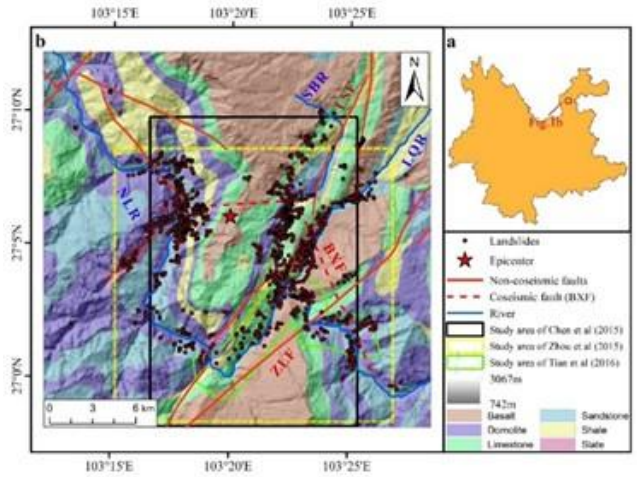

Figure 1, Geological background and seismic landslide distribution map.

Acknowledgments

This research was supported by the National Natural Science Foundation of China under Grants Nos. 42207205 and 42090051.