



Risk Assessment of High Landslide Potential Communities for Remote Mountainous Areas in Southern Taiwan under Climate Change

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Taiwan, featured by rolling hills and mountains, is one of the major islands formed by the collision of Philippine Sea Plate and Eurasian Plate. Due to plate movement, Taiwan is young in geologic age with many faults and earthquakes. Located on the west side of Pacific Ocean and close to Tropic of Cancer, Taiwan is also prone to torrential rains caused by typhoons during summer and autumn seasons. In recent years, because of extreme rainfall events, numerous landslides, heavy river siltation, and collapses of riverbank dikes can be easily triggered. However, it is inevitable that people develop and utilize slopes for economic benefits. Among the slopes developed, some are landslide sensitive. Moreover, the dramatic changes of mountain areas cause the risk of disaster to increase while the adjustment capacity decreases. Accordingly, this research performs risk assessment for high landslide potential communities in remote mountainous areas in southern Taiwan.

In this study, years of disaster records such as rainfall events and land changes are collected based on the interpretation of satellite imageries. The time series data are then analyzed and data mining techniques of classification are applied including models of artificial intelligence. The landslide potential analysis model under the climate changes and risk assessment model on landslide potential and hazard vulnerability are established. Finally, the landslide potential maps as well as risk maps using geographic information system are drawn under the proposed models.

The results of this study show that the classifications are effective. Our proposed method is a useful tool in vulnerability analysis for potential rainfall-induced landslide areas since the accuracy of landslide potential prediction is proven to be at least 75% above by historical data. In addition, the risk maps generated in this research for remote mountainous areas in southern Taiwan can be a very helpful reference for the regional planning of disaster prevention under climate change.