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The Influence of Human Activities on the Occurrence of landslides within Reservoir Watershed at Southern Taiwan

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The landslide is usually triggered by heavy rainfall, earthquake or combination of both, and such natural hazards are happened very often at Taiwan due to its complex tectonic structure. Mountains account for about 70% of the total land area in Taiwan, that is result of plate collision. Therefore, the highly geological stress accumulation and frequently typhoon triggered the landslides in mountain areas. The topographic features (e.g., slope, roughness, curvature), geological features (e.g., geology, location of faults, soil type) and environmental features (e.g., precipitation, river density, peak ground acceleration) were considered to investigate the factors around landslides occurrence. Due to the limited plain areas with very high population density, the average is around 651 people per square kilometres, people developed the mountain areas for purpose of agriculture, tourism and residential areas at Taiwan. These human activities will alter the topography, land-use, land-cover, ground loading and also drainage pattern. In present research, the land changes are detected with the satellite images and checked in the field from 2011 till now in the entire Tsengwen Reservoir Watershed. After surveying in the field, land change data is noted as slope failure, agriculture activity or other human activity. To realize the relationship between human activities and landslides occurrence, the random forest (RF) algorithm has been adopted. Two sets data will be employed, and it will show the accuracy of landslides detection, the first set involves on the topographic data, geological data and environmental data; the second set combines the data in the first set and the human activities data. The results show the importance and also the degree of impact of the human activities to the occurrence of landslides in the Tsengwen Reservoir Watershed areas. Furthermore, it serves as the fundamental data to establish the legal rules for managing the mountain area.