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## The distribution and intensity of gully erosion in different soil zones of the Hengduan Mountain area

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Gully erosion was one of the key processes of soil erosion in Hengduan mountain region, which belonged to the eastern part of Qinghai-Tibet Plateau. This dramatic changes in both horizontal and vertical direction has led to a diversity soil groups within the region. The aims of this study were to investigate the gully distribution and density in different soil zones, and find out the key factors that influenced the susceptibility and intensity of gully erosion of Hengduan mountain area. Totally 2300 investigation quadrats were randomly set with the size of 1 km × 1 km to check whether the occurrence and the density by Google Earth images. The ratio of gully occurrence (GR) was 25.5%, and the average gully density (GD) and gully number (GN) was 2.22 km km<sup>-2</sup> and 20.4 of Hengduan mountain area. The annual temperature, vegetation and slope were the key factors that influences the occurrences of gullies in the alpine (>3700 m a.s.l), middle mountain (2000-3700 m a.s.l) and low mountain (<2000 m a.s.l) soil zones, respectively. The intensity of gully erosion showed exponential decreasing relationships with soil property including soil organic matters and silt content, and the average GD in different soil zones showed the same relationships with the R<sup>2</sup> higher than 0.7. These results indicating that the distribution of gully erosion were more related to the external environmental factors, and the intensity of gully erosion were determined by soil properties at the regional scales.