A field example of flexural toppling at Song-Mao Village in central Taiwan

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Landslides can pose a serious risk to the urban environment and to line infrastructures in many humid, tectonically active regions. In this study, geological and geomorphological surveys were conducted at Song-Mao Village in central Taiwan, whereas the area has been affected by deep-seated gravitational slope deformation in the long-term. Aligned at the similar elevations at 1600 m a.s.l. along both sides of the Dajia River, a series of the flat ledge is distributed and ledges on opposite sides of the river sometimes interlock, suggesting that they are the remnants of ridges above slip-off slopes of an old meandering river. The study area is located at one of the flat ledges with two free surfaces (NE-facing and W-facing) along the Dajia River. The bedrock on the upper slope consists of slate striking NE-SW with steeply dipping cleavage at 85˚ to SE and the lower slope consists of alternating beds of sandstone and slate striking NE-SW and dipping 70˚ to 85˚ to SE. The beds show flexural toppling at NE-facing and W-facing slopes, totally cover an area of 0.25 km^2. Flexural toppling has led to the formation of ridge-top depression and bulging slope at the middle slope. Active unit of the slope deformation appears at the lower slope of W-facing slopes indicated by a slope failure and its debris deposit that looked quite fresh, suggesting they probably formed recently.

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