



## **The construction of landslides achieves by using 1969 CORONA (KH-4B) image and aerial photos- A case study of the catchment of Te-chi reservoir**

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Landslides are common phenomenon in Taiwan for the extreme climate, intensive tectonic movement and highly fracture bedrock. In the study of landslides, to make the historical archive is critical for both long term monitoring and landform evolution research. For the first three decades since the 1950s, only few maps and written documents are available for the high mountain areas, so historical remote sensing data can be a viable way to achieve detailed information about human activities and landscape reaction in terms of increasing denudation.

In this study, we try to use different kind of data to identify landslides, including CORONA imagery of 969, ortho-rectified aerial photo map of 1980 and ortho-rectified aerial photo of 2004. The historical CORONA imagery can be orthorectified and georeferenced therefore can be used as a source of data for landslides identification and landslide archive construction.

The study area is in the upper catchment of Ta-chia River. This area is the homeland to Taiyal aboriginal tribe. The Tachia River is “Taiwan’s TVA” in terms of its vast hydroelectric power potential. The rough terrain makes accessibility very difficult, isolating the upper Tachia basin from the rest of Taiwan’s densely populated areas. The construction of the Central Cross-Island Highway officially started in July 1956 and was completed in May 1960. It connects the towns of Tong-shi in the west and Taroko in the east, across the upper Ta-chia basin. There are branches off to the town of Pu-li in the south and I-lan in the north, so the upper Ta-chia basin becomes the pivotal node for cross-island traffic in four directions. Apart from its military purposes, the Central Cross-Island Highway has a substantial impact on the mountainous areas of upper Tachia basin, the most important aspect being the increase of population and farming. The rough terrain makes the human accessibility very lower so the upper Ta-chia basin is isolated from the rest of densely populated Taiwan before the construction of the Central Cross-Island Highway.

The ortho-rectified CORONA image and aerial photos can be used to identify landslides and provide more information about the causes of landslides and the consequences of road construction, landform evolution and agriculture practice. The long term landslide archive can be used in the study of landscape evolution and hazard assessment. There are more than 800 landslides identified in CORONA image and 900 landslides in 1980 aerial photos, which were caused by road construction, farming practice and channel erosion.