Application of Multiple-Temporal Satellite Imagery with UAV Technology to evaluate Post-typhoon Event Remediation Efficiency in Shihmen Reservoir Watershed

Chun-Kai Chen¹, Bor-Shiun Lin¹, Chih-Hsien Chen², and Chao-Chin Pai²
¹Disaster Prevention Technology Research Center, Sinotech Engineering Consultants, Taiwan. (ckchen@sinotech.org.tw)
²Taipei branch, Soil and Water Conservation Bureau, Council of Agriculture, Executive Yuan, Taiwan.

This study utilized multiple-temporal satellite imagery with UAV and IoT technology to evaluate and monitor the post-typhoon event remediation effectiveness of soil and water conservation of Shihmen Reservoir Watershed from 2015 to 2018.

A combination of the historical event-based landslide inventory and a collection and recent satellite imagery with coverage of the area pre- and post-typhoon MANGKHUT in 2018 were applied to evaluate landslide process, evolution and sediment environment change. In addition, two UAV operations were completed and captured over 160km² in the 5 sub-watersheds to validate the remediation effectiveness and environmental change.

The results show that the landslide area within Shihmen Reservoir is less than that of the 1994 typhoon Aere and has no increased tendency. Effective conservation and remediation work can effectively reduce the sediment discharge of meteorological events and decrease the turbidity of the water at the storage point. In addition, the vegetation coverage rate of the entire Shihmen Reservoir watershed is close to 90%. Except for the occasional localized deforestation, the vegetation coverage has gradually stabilized.

Keywords: Shihmen reservoir, Remediation Efficiency, UAV and IoT Technology