Ming-Der Yang
mdyang@nchu.edu.tw

Ming-Der Yang is a professor in the Department of Civil Engineering and presently serves as the Chair of the Center for Environmental Restoration and Disaster Reduction (CERDR) at National Chung Hsing University. He received his B.S. degree in civil engineering from the National Chiao Tung University, Taiwan, in 1990, and the M.S. and the Ph.D. degrees in 1993 and 1996, respectively, from Department of Civil and Environmental Engineering and Geodetic Science, the Ohio State University, Columbus, Ohio, USA. His research interests include image processing, remote sensing, geographic information system, and environmental monitoring. Recently, research efforts have been put on applying remote sensing on disaster monitoring and assessment, such as mapping of the 26 December 2004 tsunami disaster by using FORMOSAT-2 images and applications of remotely sensed data to the disaster assessment of landsides induced by Chi-Chi earthquake, Typhoon Mindulle, and Typhoon Morakot.

Ming-Der Yang

mdyang@nchu.edu.tw

Professor

Department of Civil Engineering

National Chung Hsing University

Taichung 402, Taiwan

Landslide-Induced Disasters in the Central Taiwan

The geological formation of Taiwan, where is located at an active tectonic plate, is so young and unsteady to be prone to sloping and landsliding. The occurrence probability of landslide is comparably high in the central Taiwan, especially after the Chi-Chi earthquake in 1999. Besides, climate change increasing the rainfall intensity and human cultivation changing the landuse exacerbate the damage of the landslide catastrophe. In the past decade, hundreds of hillsides and landslides were identified in the central Taiwan due to the fragile geological environment and heavy rainfalls. During Mindulle and Morakot typhoons, which are the most serious rainfall events in the last decade, the catastrophic investigation of the disaster scene, including field survey, outcrop investigation, and remote sensing investigation was executed to reveal the inundation for disaster response. Applying GIS and GPS, field survey was carried out for prime investigation immediate in the end of the flood. SPOT and FORSAT-II satellite and airborne images provided temporal and spatial information for inundation investigation and scenario simulations. Not limited to hill slope sliding, the landside-induced disasters are complex and include debris flows, river bed lift-up, levee failure caused by hyper-concentrated sediment flow, and landslide dam. The river bed has been significantly rose up by sediments originating from landslides in the watershed that threatens the structures and property in the downstream, such as levees, bridges, farms, and houses. The landslides nearby the river bank stock the stream and detour flow, and even generate a landslide dam threatening the downstream areas. Considering the detriment of landslides, a basin management strategy for the rivers in the mountainous area should have revolutionary thoughts beside traditional water-only concern.