A Comparison Analysis of the Land Use Change Detected by Satellite Imagery and the Ground Patrol

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Over the past decades, economic patterns in Taiwan has been transferred from agricultural-based society to industrial-based society. The land-use changes and rate of development in slope area are increasing by economic growth has aroused the government and the public’ s attention to the reservation of environment.

In order to reduce illegal land-use developments in the slope areas, the government had been applying two projects: one is the satellite monitoring, the other is the ground patrol. The purpose of this study is to analysis the differences of the monitoring results of the satellite monitoring and the ground patrol.

For the satellite monitoring project used SPOT6/7 satellite images (1.5-meter spatial resolution) to carry out a large-scale and multi-temporal monitoring on land-use changes, and the investigators will go to the field to report the legality to the government monthly. For the ground patrol project, the investigators employ the mobile devices to patrol the roads near the slope areas. When the suspected change areas are found, the investigators will report the results back to the government in time.

The results indicated that the change areas of the satellite monitoring project were larger than the one of ground patrol projects and the distances of the satellite monitoring project to the roads were longer in comparison with the ground patrol projects. For the most part, the change areas of the satellite monitoring were average 1,250 square meters and average distance from the roads 100 meters. However, the change areas of the ground patrol were average 300 square meters, average distance from the roads was 8 meters, and most of the locations were next to the roads.
As stated above, the change areas of the satellite monitoring were larger and most of the locations were next to away from the roads in comparison with the ground patrol projects. However, these projects are not full-fledged. The satellite monitoring was limited by the monitoring frequency, the weather conditions and resolution of satellite imagery. In addition, the ground patrol project was limited by orographic conditions. Therefore, integral applications of satellite images and periodical ground patrol can reduce the works of ground patrol. The field investigators can focus on these change areas and avoid the unnecessary investigations in limited resources and manpower. The illegal land-use development will be curbed efficiently as well.

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