geomorphology in granite and granodiorite areas. These differences in landslide sites reflect
ground conditions.

**Key words:** airborne laser scanner, shallow landslide, granite, granodiorite

The use of ortho-rectified CORONA (KH-4B) image as a historical archive in land
use of the high mountain areas in Taiwan

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Land use change detection is of high interest when one tries to trace the degradation of
the landscape in space and time. In case there are no maps and only few written documents
available, historical remote sensing data or aerial photos can be the solution. The first step
in achieving detailed information about the land use is to build up a series of historical
archive of image datasets. Because of the high relief, the mountain area is remote and with
little population, therefore few aerial photos were taken. So it may be difficult to acquire the
historical image, considering that the images have to be ortho-rectified and converted into a
common reference system. This study intends to prove, that historical CORONA – imagery,
de spite its strong geometric distortion, can be ortho-rectified and georeferenced. The ground
resolution of original image is 1.8 m and it can achieve and a position accuracy of 12 m in
average under the condition of the availability of a good quality DEM, 40 m resolution in
this study. On the other hand, we show the capability of the CORONA imagery for land use
change detection in the mountain area of Taiwan. The study area is in the upper catchment
of Daja River, including Haunshan, Lishan and Wulin farm, which were partly developed for
agriculture activities, such as fruit and vegetable farming. The land use and land cover types
identified from CORONA – imagery include fruit farms, vegetable farms, build-up areas,
landslides, forest and deforested areas for its high resolution. Besides, the imagery can also
show the deforestation and early stage of agriculture practices. This image can be a part of
datasets of the land use and land cover change in the upper catchment of Daja River and it
could be a good dataset for further land use change studying.

**Key words:** ortho-rectification, change detection, land use, high mountain, Taiwan

The impact of urbanization on climate change in Taiwan

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The terrain of Taiwan is very complex and the weather and climate are very diverse
around the island. In recent years, industrialization and urbanization have changed the
environment a great deal. Cultivation of mountain slopes and the cut of frost are also very
common and may lead to climate change. In this study, we compared the climate before and
after urbanization in Taiwan using two 10 years average periods. One is from 1961 to 1970
and the other is from 1991 to 2000. Result showed that most of the city’s temperature
differences between the two 10 years average have increased, only a few city’s temperature
average has no change. The average of rainfall amount and rainfall day showed that some