

APPLICATION OF SRTM3 AND LANDSAT ETM+ TO GENERATE GEOMORPHOLOGIC MAP FOR THE PURPOSE OF FLOOD RISK MAPPING IN HOI AN, VIETNAM

Ho Thi Kim LOAN, Masatomo UMITSU

Graduate School of Environmental Studies, Nagoya University, Japan

Email: ho.loan.thi.kim@b.mbox.nagoya-u.ac.jp

ABSTRACT

Use of geomorphologic map for flood risk mapping is obviously necessary for a frequently flooded area. Hoi An ancient town is the cultural World Heritage, which has experienced flood almost every year. It needs to protect from disasters. The urbanization is occurring rapidly, Hoi An became the most density town in Vietnam with 12,000 people/km². Hoi An is located in an alluvial plain of Thu Bon river that is characterized by braided channel pattern and low-relief terrain.

Using conventional methods to make DEM (Digital Elevation Model) and geomorphologic classification map by aerial photos commonly takes time and money. Moreover, these kinds of data of Hoi An are insufficient and inconsistent. Therefore, utilizing remote sensing sharing data to conduct such kind of research is more feasible and convenient. The objective of this study is to generate geomorphologic map by using SRTM and LANDSAT.

SRTM (Shuttle Radar Topography Mission) launched in February 2000, especially 3 arc-second SRTM data (SRTM3) with 90 m resolution, has provided invaluable elevation data. Although application of SRTM still approaches some technical problems such as low resolution, systematic noises, and voids (spikes and wells), SRTM has served as functional topographic data for targeting the geomorphologic delineation. In this paper, voids have been filled by interpolation with free software 3DEM. In order to have a better understanding about the study area, this study uses LANDSAT ETM 30m spatial resolution. Panchromatic band of LANDSAT image proves the potential to detect in detail the concerning objects when merging with other bands. Land cover surface was classified by supervised maximum likelihood. Then, the result of classification was visually compared with digital elevation model derived from SRTM in the same area. Accuracy of the result was validated by doing field survey.

Consequently, we could clarify the landforms of Hoi An alluvial plain including natural levees, flood basin, sand dunes, sand bars, back marsh and terraces. The result of this study is expected to be an efficient method for flood risk mapping in low-land area.