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### **Abstract**

This study was designed to develop the model and technique for soil mapping in slope complex areas by using geographic information system (GIS), and to analyse the database structures of soil forming factors as well as to evaluate satellite imagery for soil survey and mapping. The study area, Amphoe Wang Sapung, Changwat Loei, covers an area of about 1037 km<sup>2</sup>. This study was conducted only the soil formed in the area of 4 different geologic Formations. These include Wang Saphung, Nam Mahoran, Huai E-lert Formations and igneous rocks. Soil-landscape model was developed to generate soil mapping unit accordingly.

A soil mapping unit, based on the combination of soil forming factors, or defined theme layers was created for overlay process. The defined theme layers include vegetation, parent material, elevation, slope gradient and aspect. The theme layers were collected from existing information, aerial photograph, satellite data and ancillary data. Spatial information of vegetation was prepared from satellite data and aerial photograph in combination with the ground survey. Geological map of Dept of Mineral Resources provides information about parent rocks at the scale of 1:50,000. Topographic information is based on topographic map (1:50,000) of RTSD. Each of the above mentioned layers and its associate attributes was digitally encoded in a GIS database to create thematic layers. Overlay operation on the layers produces a resultant polygonal layer each of which is a land mapping unit with its characteristics. Field investigations in combination with soil and mineral analysis offer information in order to create taxonomic units.

Satellite data provide some information on vegetation, landscape and drainage patterns upon which soil characteristics can be inferred.

As a result of dynamic and complexity of the areas in association with small scale data layers leads to further study in terms of the relationship between soil types and its forming factors.