

INTEGRATION OF REMOTE SENSING AND GEOGRAPHICAL
INFORMATION SYSTEM (GIS) FOR ANALYSIS OF LAND
COVER CHANGES AND SENSITIVE AREAS

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MASTER OF SCIENCE
KOLEJ UNIVERSITI TERENGGANU
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TESIS

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SENSITIVE AREAS**

By

RAZAK BIN ZAKARIYA

THIS HARDWORK IS SPECIALLY DEDICATED TO MY FATHER, ZAKARIYA B.
YAHYA, BELOVED MOTHER, WANITA BTI ABU, BROTHER, ASRUL, SISTERS,
ZARINAH AND AZLINAH.

**Thesis Submitted in Fulfilment of the Requirements for the
Degree of Master of Science in the Faculty of Science and Technology
Kolej Universiti Terengganu
Universiti Putra Malaysia**

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment
of the requirement for the degree of Master of Science

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DEDICATION

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Integrating remote sensing and Geographical Information System can successfully increase the performance and efficiency for studies on forestry, agriculture and town development management. In this study, the integration of the two disciplines was used to detect land cover area, type of land cover, land cover changes and sensitive areas within the administrative boundary of Mukim Kuala Kuantan, Pahang. The study area covers approximately 78,368 hectares. For land cover determination, satellite image (Landsat TM) with band combination 4,5,3, captured on 27th June 1997 was analyzed and classified using 'Maximum Likelihood Classifier (MLC)' with overall accuracy of 87.4%. From the results, 16 classes of land cover were differentiated. There are zones of High Vegetation, High Development, Low Development and Shrub, Mangrove, Associate Mangrove, Cleared Area (for agriculture), Cleared Area (for development), Oil Palm (mature), Oil Palm (immature), Rubber (mature), Rubber (old), Grassland, Peat Swamp, Swamp, Water (with vegetation) and Water. In digital image processing, GIS

technique was used for boundary determination, locating small rivers and various types of road classification. All these information were useful especially in locating the area during 'ground truthing' determination.

Determination of land cover changes was done by comparing two satellite images dated the 14th of February 1991 and the 27th of June 1997. These images were classified and overlaid using GIS technology. Various land cover change such as land cover classes types, land cover area, 'from-to' change detection and re-planting areas were successfully identified. From the result, Mukim Kuala Kuantan was defined as a developing area with most of the development taking place in and immediately surrounding the Kuantan town area. This was based on the location and increment of High Development class from 2,003 ha to 2,984 ha and 'Low Development and Shrub' class from 11,724 ha to 16,168 ha in 6 years. In addition, sensitive areas including buffer zone, stated in various government department regulation or guideline were successfully defined. This study, therefore, implies that the integration of remote sensing and GIS techniques is an accurate, fast and easy method to identify land cover, land cover changes and sensitive areas for mapping and classification purposes.