An Assessment of Spatial and Temporal Changes of Land use - Using Remotely Sensed Data Sources (A Case Study of the Sri Jayawardhanapura Kotte Municipal Council Area)

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ABSTRACT

Land is a fundamental and finite resource for most human activities. Humans have been altering land cover since pre-history through their multiple activities, including agriculture, livestock, industry, living space and recreation. Although the land cover and land use changes are substantial, they are difficult to grasp when they occur incrementally. One of the most appropriate sources for monitoring these processes is remotely sensed data sources. Temporal mapping from remotely sensed data sources can successfully demonstrate the conversion of land cover and land use changes. The difference between these maps can reflect the changes and the distribution of land cover and land use that have occurred during the intervening periods. In this study, an attempt was made to identify and assess the spatial and temporal changes of land use in the Sri Jayawardhanapura Kotte Municipal Council area in the Colombo district from 1972 to 2003. Sri Jayawardhanapura Kotte is the administrative capital of Sri Lanka and it was established as a Municipal Council in 1997. Due to the progress of urbanization and the urban growth afterwards, the pace of changes of the land use in that area keep rising. Therefore, a detailed assessment of land use changes of the area would be useful to disclose important information regarding land use changes, which have not been highlighted so far.

Four remotely sensed data sources such as aerial photographs of 1972, published metric sheet of 1984 and Landsat ETM+ satellite images of 1992 and 2003 were taken for four decades according to the availability of data. Two different interpretation methods were carried out to identify the land use types in each year. The aerial photograph was manually interpreted and the technique adopted to extract the land use types from satellite images was the 'supervised classification' method in Remote Sensing (RS). In order to assess the spatial and temporal

changes of land use, the technology of Geographical Information System (GIS) was used.

The results showed that there were six different major land use categories: build up areas, forests, home-gardens, marsh areas, paddy and water bodies and these features explained that there have been significant land use changes between 1972 and 2003 in the study area. These changes were characterized by a severe replacement of home-gardens and built up areas with forest and marsh areas. The highest percentage of land use was under home-gardens from 1972 to 1992 and in 2003 the built up areas contained the highest percentage of the total land extent. An increasing trend could be seen in build up areas while all the other land use types were showing a decreasing trend in the Municipal Council area. The information extracted from the study reveals that a comprehensive study of historical changes of land use will help to enhance the capability to predict future land use changes, and it can contribute to effective management strategies and policies for rational land use in the area.