

Abstract

Wetlands are economically and environmentally significant resources and provide unique ecological and social functions. Most of the people depend on the wetland resources for their livelihood. Knowledge of spatial distribution of wetland categories and its optimum utilization is a prerequisite for sustainable planning, use, and management of the wetland resources. Satellite remote sensing data have become increasingly important in the study of wetland types and Geographic Information Systems (GIS) is used to analyze the spatial pattern of wetlands and to produce optimum utilization scenarios based on considering environment, economic and social objectives of the area concern. The objectives of this study are to prepare wetland types and land cover map using high resolution satellite images; to identify the suitable lands for different land use objectives representing environmental, economic and social goals of the study area; and identify the future land use allocation model for optimum utilization of wetlands.

In this study, spatial, economic, environment and social related information were gathered through satellite images, field visit, discussion, stakeholders meeting and materials published by government and nongovernmental institutions. This data was interpreted and analyzed using different techniques. Image interpretation technique was used to prepare wetland types map and land cover map. Land suitability for land use goals was carried out using spatial multi-criteria analysis and Land Use Conflict Identification Strategy (LUCIS) model have been used to allocate optimum future land use scenario based on stakeholders' preferences and potential land use conflicts.

As a result of this study, seven wetland types have been identified and these wetlands were further classified into eleven land cover types. Spatial pattern of physical land suitable and community preferences for defined land use goals were produced in this study. Finally, future land use allocation model for optimum utilization of wetland was prepared.

This is the first study of wetland inventory in the study area using satellite images; hence, it provides up-to-date wetland and land use inventories. District and divisional level decision-makers of the Jaffna Peninsula always call for improved and up to-date inventories of land and water resources, their capability, and their use for site selection, resources allocation, and decisions for all form of economic development, and environmental conservation. Application of advanced spatial analysis techniques produced all such information in this study.