Land Allocation for Crops through Spatial Multi-Criteria Evaluation Approach: A Case Study of Jaffna Peninsula, Sri Lanka

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The goal of sustainable land use planning is to meet the needs of all prospective land users while at the same time ensuring that the natural resource base is protected. One of the main prerequisites to achieve this goal is to allocate the land to the most compatible crops from the ecological point of view. Spatial multi-criteria evaluation approach supports the decision-making process for allocating suitable land for different kinds of crops.

Though Jaffna Peninsula is predominantly an agricultural region, however more than fifty per cent of its area has a low potential for crop production. Crop production is restricted by the low and unreliable rainfall, and soil characteristics such as shallowness, extreme sand and salinity. Therefore, competition for the available good land for different kinds of crops is very high and the crops are cultivated in the areas which are not conducive to their growth. Limited land resources and crop production on marginal and ecologically unsuitable land lead to land degradation and conflicts among the different stakeholders involved in the crop production activities. It is proved that crop productivity, employment rate and income level can be increased without causing degradation of environment, if proper decisions on land allocation for crops are made.

Multi-criteria evaluation (MCE) and Geographic Information System (GIS) integration have been proved as a powerful approach to allocate suitable land to different kinds of crops on rational and scientific manners. GIS enables computation of different criteria while MCE can be used to analyze the land suitability for different crops. Again, the GIS visualize the results in the form of maps and tables. The combination of MCE and GIS is referred as Spatial Multi-Criteria Evaluation (SMCE). In this study SMCE approach has been used to allocate suitable land for different kinds of crops in Jaffna Peninsula.

Key Words: Multi-criteria evaluation; Land allocation; Jaffna Peninsula; Suitability; Geographic Information System

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