

GIS-based land suitability mapping for rubber cultivation in Seremban, Malaysia

ABSTRACT

Land suitability evaluation (LSE) is a valuable tool for land use planning in major countries of the world, including Malaysia. Previous LSE studies focused mostly on the use of biophysical and ecological datasets for the design of equally important socio-economic variables. This study presents sub national level estimation of suitable agricultural lands for Rubber crops in Seremban, Malaysia, combining physical, biophysical and ecological variables. The objective of the study was to provide an up-to-date GIS-based agricultural land suitability evaluation (ALSE) for determining suitable agricultural land for Rubber crops in the study area. Biophysical and ecological factors that influence agricultural land use were assembled and the weights of their respective contributions were assessed using analytic hierarchical process. For Rubber cultivation, Lenggeng, Pantai and Setul are the most suitable; while Ampangan, Seremban, Rasah, and Rantau are moderately suitable. Since Seremban, Labu, and Pantai are not suitable for growing rubber. The total suitable land for rubber cultivation in Seremban district is 35575 hectares distributed among the classes as: 16048 hectares is highly suitable, 15399 hectares moderately suitable and 4128 hectares is marginally suitable. These values represent 45%, 43% and 12% respectively. Quantitative assessment of the model's detection accuracy reveals to what extent it is sensitive to suitable and non-suitable land with sensitivity and specificity values of 84.14% and 76% respectively and overall accuracy (area under the ROC curve) of 0.80 (80%) with p-value of <0.0001 at 95% confidence interval.

Keyword: Multi criteria; Analytical hierarchy proses; GIS; Rubber