

Developing Policy for Suitable Harvest Zone using Multi Criteria Evaluation and GIS-Based Decision Support System

ABSTRACT

Natural resources management often entails making choices among alternatives. Decision support tools are instruments for making rational decisions, particularly geographical information system (GIS) technology-incorporates the multi criteria evaluations (MCE) and analytic hierarchy process (AHP). Therefore, the objective of this study is to determine the suitable forest harvest zone in hill tropical forest in Peninsular Malaysia using MCE and GIS as a tool for decision support system. The implementation of the AHP method for MCE has shown the capabilities of integration of a GIS and decision support system, where the data was prepared spatially in a GIS, an analysis is performed with the systematic evaluation method. The MCE allows both constraint and criteria maps to be combined in arithmetic operation in a suitability analysis, and also allows for criteria maps to be assigned variable weights. From the weights derived from the AHP method, it can be seen that slope and elevation were strong factors in allocating the suitable harvest zone (0.63 and 0.29). The hydrological aspect is the third most important factor, with 0.07. The total suitable area for productive forest zone was 9757.30 ha (96.06%) and the designated protected forest was about 399.20 ha (3.94%). This implies the importance of certain forest land to be classified as a restricted area for logging purposes to ensure the sustainable forest ecosystem and water resources. This result demonstrated that the methodology used has high potential and functionality for determining suitable forest harvest zone from several criteria for hill forest. Finally, it can be concluded that, MCE incorporating GIS provides an ideal tool and essential in modelling with flexibility and the ability for spatial modelling operation for site suitability study in hill forest of Peninsular Malaysia.

Keyword: Suitable harvest zone, Geographical information system, Multi criteria evaluation, Analytical hierarchy process