

## **The Environmental Elements in Multi Criteria Analysis (MCA) of Land Suitability for Comprehensive Land Use Planning in Johor, Malaysia**

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**Abstract:** The environmental related issues have become crucial in relation to the concern of environmental protection versus the growth of socio-economic development. The advanced technology is therefore required for a better decision making process. Thus, this research addresses the application of GIS-based approach via Multi Criteria Analysis (MCA) in identifying the incorporation of environmental resources for a comprehensive land use planning in the state of Johor. The selection of Johor is appropriate taking into consideration its rapid rate of urban development growth and the over longling environmental pressure despite the availability of abundance of environmental resources such as forestry, rivers, coastal and islands. The research employed the collection of secondary data covering both the environmental and socio-economic information in the form of textual and statistical data in GIS/Mapinfo format to resemble the appropriate data for spatial mapping outcome using the sieving technique process. A total of 18 sets of spatial data (five physical attributes and 13 environmental attributes) were collected, prepared and arranged accordingly into the designated model consisting of seven steps, where calculation processes took place subsequently through the application of a grading system depending on three classes of weightage. The results demonstrate the suitability of developable land based on different development objectives, indicating the distribution of location and size of areas. The inclusion of environmental sensitive areas (ESAs) ranging from highly sensitive, moderate sensitive and low sensitive towards the development impacts are the basis for the plan formulation. It is clearly seen that the outcome of the composite can direct the future development in term of focus-prioritised area. The spatial distribution can be referred to in the process of decision making process dealing with the comprehensive land use planning. This is in line with the aspiration of the direction of Sustainable Development Goals (SDGs) in which the planning and development of the socio-economic is the priority for the community without disregarding the importance of environmental resources.

**Keywords:** sustainably, land use, environment, sieving process, GIS.