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Feasibility Study of Railway Line in Hilly Region using GIS

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Abstract

Aim of this study is to demonstrate the potential of GIS and multi-criteria decision approach (MCDA) as a tool for the selection of alignment of rail route in Hilly region. In the present study, Geographic information system (GIS) and multi-criteria decision approach (MCDA) is used to plan the alignment of railway route from Bhuntar to Kullu in Himachal Pradesh (HP), India. The various factors which affect the alignment of rail route are identified in this study. The factors considered in this study are topography, land-use, distance from power line, drainage pattern and road network of the area. The Analytical Hierarchy Process (AHP) is used to determine the ranking of the relative parameters. The determined ranking is used in pair-wise comparison to find the weights of these relative parameters. The maps with weighted parameters are overlaid and resultant map is created in GIS for route finding, station location and alignment of railway. The final map shows the cumulative effect of all the factors which affect the rail route alignment. The final map is divided into four parts based on feasibility index. It is found that 55% area is highly feasible for route alignment while 25% of the total area comes under category of low feasibility.

Keywords

Geographic Information System (GIS), Multi-Criteria Decision Approach (MCDA), Digital Elevation Model (D.E.M), Analytical Hierarchy Process (AHP), Transportation Planning

Full Text:

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