DESIGNING OF FOREST ROAD NETWORK BASED ON TECHNICAL AND ECONOMICAL CONSIDERATIONS USING GIS & AHP

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ABSTRACT

Designing of forest road network is a complex engineering problem. Therfore, the economic and environmental issuuse should be considered in forest road network designing. The aim of paper is to develop a method using GIS and Analytic Hierarchy Process (AHP) to design a forest road network with the lowest construction cost while maintaining other technical requirements. First of all, the required data was collected from the study area. Then the necessary maps including slope, aspect, altitude, soil, geology and standing volume was determined as well as the importance coefficient of each layer of maps was determined via Expert Choice (EC) software. Then, road planning potential map was prepared by overlaying these layers. Finally, the proposed road network techniqually evaluated by merging the planned road network and road planning potential map based on Backmund criteria. Results indicated that the proposed road network with density of 10.67 m/ha and 81.6% road coverage is preffered to the existing road.

KEYWORDS: Forest Road Network Planning, GIS-AHP Method, Expert Choice, Iranian Caspian Forests