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Land Suitability Evaluation for Selected Trees using GIS Technique: A Case Study on Salt Affected Land of Southern Pakistan

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Abstract

This study was to investigate the applicability of the GIS techniques in combination with FAO land evaluation approach for analyzing the land suitability for certain trees in Badin district southern Pakistan. At first, the databases for GIS analyses had to be developed. The data were obtained through scientific literature review, expert opinions, interviews, different national and international organization and professional officers. The suitability assessment in the studied area has been done by parametric FAO/ ITC-Ghent evaluation method.

On the basis of the established GIS databases, in the Badin district a total area of 669,027 ha, and salt affected area 391,619 ha, 27 land units could be distinguished after overlaying the thematic maps. Firstly, the classification of land suitability for trees *Acacia nilotica*, *Eucalyptus camaldulensis* and *Prosopis juliflora* revealed that there is area of high-suitability level (S1) is 277,408 ha (not salt affected), the area of medium-suitability level (S2) is 279,365 ha for selected trees and 44,280 ha of low-suitability level (S3) The area of non-suitability level (N) is 67,974 ha on salt affected soils. The limitations of suitability included three dominant factors as soil salinity and sodicity, topsoil depth and two additional factors as soil texture and soil type. The final result shows that the total area of Badin district 669,027 ha in which 391,619 ha is salt affected (slight to high salinity levels) and 277,408 ha is not affected by salinity / sodicity so it could be more suitable area for growing above selected trees.

Integration of GIS and multi-criteria approach for land suitability analysis could be a useful methodology for further research in Badin district. This approach makes it possible to select suitable land use types and trees for each administrative unit at commune level.

Keywords: Badin district, GIS, land evaluation, land suitability, trees