عنوان مقاله:

Irrigation site selection using hybrid GIS-based approach

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خلاصه مقاله:

BACKGROUND AND OBJECTIVES:The use of traditional site selection methods for potential irrigation schemes is so common in Malawi. The overdependence of these methods has had significant consequences on the environment such as pollution, siltation, and land degradation and soil erosion. Traditional selection of irrigation sites is a complex task which is time-consuming, costly and involves collection of a lot of data sets. However, advances in Geographic Information Systems present an opportunity to easily integrate complex systems involving a lot of data sets. The objective of this study was to identify potential areas for irrigation farming in Kasungu district in Malawi using hybrid spatial datasets. METHODS: Multi criteria decision analysis approach was used in Arc GIS 10.8 to analyze datasets such as slopes, rivers, land use, soil types, soil depths, water quality, water quantity and drainage patterns. A questionnaire was used to solicit expert views on factors to consider when siting feasible irrigation areas. FINDING: This study observed that the use of Geographic Information System in irrigation site selection is flexible and time efficient due to its ability of handling complex and huge volume of datasets. Moreover, the produced maps enhanced an easy understanding of the identified areas hence providing an aid to making right decisions in environmental management. The study found that in Kasungu district, 36.9% of the land is highly suitable, 20.7% is moderately suitable, 33.1% is lowly suitable and 9.3% is not suitable for irrigation. CONCLUSION:This paper provides good information on promoting the utilization of GIS to solve site selection problems in a bid to reduce soil erosion, pollution and improve land management. The study recommends the promotion of using GIS in government agencies for better decision-making in sustainable irrigation development. The scientific approach used in this study can also be extrapolated in the assessment and evaluation of water resources in Malawi.

کلمات کلیدی:

Climate change, Irrigation development, Kasungu, Model builder, Spatial data

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