GIS Based Identification of Water harvesting potential Area in the Bale Lowland of South Eastern Ethiopia

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Abstract

Assessment of potential surface runoff harvesting sites is an important undertaking in a country like Ethiopia, where high spatial variability in rainfall and recurrent drought and flash floods are common. In this study, the geographical information system (GIS)-based multi-Criteria Evaluation is used to select the potential rainwater harvesting sites in Oromia, Bale lowland, Ethiopia. Analytic Hierarchy Process (AHP) is used for standardization of the criteria, and Weight overlay analysis of multicriteria for a combination of multi-layers using ArcGIS 10.8. Six criteria layers, including slope, runoff, soil depth, precipitation, soil texture, and the land use land cove are derived to identify rainwater-harvesting catchment. The analysis, shows that of the total 500 km ^{2} of the catchment area, 29.18 % of the area has highly suitable, 40 .87 of the area has Suitable ,22.49% of the total area has moderately suitable ,6.98% of the area has marginally suitable and 0.5 % of the area is not suitable for runoff water harvesting at the study area. It was noted that providing accurate and precise spatial representation of the physiology and land use for the analysis of runoff generation potential site within the study area is an important step in developing an integrated strategy for surface rainwater harvesting plan the study area.

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