Multicriteria Analysis of LRI for Assessment of Soil and Land Potential Zones using Geo-statistical methods

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Abstract

Land resource inventory (LRI) of Kumarchincholi micro watershed was conducted on cadastral base map of 1:7920 and merged imagery of Cartosat-1 and LISS-IV to find out the Soil and land potential zones. With the help of surface and profile sample analysis, soil and land characterization was done to classify the soils into different soil series with their phase denoted as mapping units. Thematic layers such as soil texture, depth, slope; erosion, soil organic carbon and soil map were prepared on cadastral base map. By considering Storie rating of each parameter of a mapping unit, surface and subsurface features of soil and land were assigned with different weights as per Analytic Hierarchic Process (AHP). The soil and land potential zones were obtained by overlaying all the thematic maps as per weighted overlay methods using the spatial analysis tool in ArcGIS 10.6.1 as High potential zone (419.95 ha) and Low potential zone (144.81 ha). Both the potential zones were assessed with crop suitability categories established based on LRI finding as S1, S2, S3 & N for major field and horticultural crops cultivated in the study area. Crops with S1 & S2 category were found falling under High potential zone. Whereas, crops with S2, S3 &N categories were found falling under Low potential zone. The outcome of the investigation aims to identify the soil and land potential zones at micro watershed level for each mapping unit, which can be scaled up to sub-watershed, where similar mapping units and conditions are prevailing.

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