Mustard crop suitability mapping using analytical hierarchy process in the Imphal–Iril river sub-catchment, Manipur, India

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Land suitability analysis is method for obtaining optimum utilization of naturally accessible land resources. This study aims to identify the mustard cultivation suitability potential sites in *rabi* season using analytical hierarchy process (AHP) in the Imphal–Iril river catchment Manipur, India. Using the geospatial approach, the assessment was conducted by using climate, soil and topography data. The findings indicate that AHP method could potentially be used to classify suitable zones for mustard cultivation. Highly suitability zones for mustard were observed in the valley portion having mild slope while moderately suitable sites were primarily found near the foothill, which have a gentle sloping topography. Not suitable zone were found mostly in the hilly regions. This assessment will helpful for cropping management option to the regional growers and the policy makers to achieve high production of mustard in the region.

Keywords: Analytical hierarchy process, land suitability, land use land cover, mustard.

plenty of sunlight for optimal production. They prefer moderate temperatures below 25°C for development and growth. At temperatures less than 3°C and over 35°C, the plant ceases to grow and becomes stunted. Rainfall of 450–1000 mm during the growing period is desirable. The crops prefer neutral pH; however, excellent results have been observed between pH 6 and 7.5, and they are more resistant to acidity than alkalinity. Sandy loam and loam soils are reported to be the most favourable for mustard production[1].

Mustard is drought-tolerant and thus may be cultivated in arid and semi-arid environments[2]. Climate change has become a global issue, influencing agricultural productivity and food security worldwide[3]. Since agricultural land is a limited resource, expanding the area cultivated is not possible. To improve agriculture output with the available land, land suitability classifications should be identified. Crops must be cultivated in the most suitable location, and site suitability assessment is required for long-term agricultural productivity[4,5]. Sustainable agriculture involves choosing the crop that will grow best in a particular loca-