



A GIS and remote sensing based multicriteria analysis for identifying potential agricultural land: A case study on Savar Upazila, Bangladesh

Raju Ahmed^{1*}, Shaikh Mehdee Mohammad², Ummul Momanin Coalee¹, Khandakar Hasan Mahmud¹

¹ Department of Geography and Environment, Janagirnagar University, Savar, Dhaka- 1342

² Rural Development Academy (RDA), Bogura- 5842

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*Corresponding Email:

raju.45@geography-juniv.edu.bd

ABSTRACT

Despite of gradually decreasing its contribution to gross domestic product (GDP), agriculture, however, is the backbone of the Bangladeshi economy. Farming is the primary mean of rural livelihoods in Bangladesh but agricultural land is slowly declining day by day. Although, at present, Bangladesh is self-sufficient in terms of producing food, especially rice and some other major agricultural products, it is predicted that, in near future, the country is going to face immense challenges due to climate related threats. The research aims to identify the potential lands for suitable farming in Savar Upazila (sub-district) under Dhaka district applying a geographic information system (GIS) and remote sensing (RS) based multicriteria analysis. Relevant biophysical characteristics of soil, terrain, and landuse and land cover (LULC) were considered. Soil and elevation data was collected from Soil Resource Development Institute (SRDI) and Shuttle Radar Topography Mission (SRTM), respectively, whereas satellite images were collected from Landsat-8. The maximum likelihood supervised classification technique was used for LULC classification, and the multicriteria evaluation (MCE) and analytical hierarchy process (AHP) approach was employed to identify suitable areas for farming. The research finds the LULC classes are agricultural land, built-up area, fallow land, vegetation cover, waterbodies, and wetland are 12.42%, 31.01%, 25.69%, 25.98%, 4.81%, and 0.09%, respectively. This research also finds that agricultural land suitability was classified as highly suitable, moderately suitable, marginally suitable, and not suitable are 24.28%, 29.53%, 24.66%, and 21.53%, respectively. In contrast, the current agricultural land usage accounts for just 12.42% of the total land area in this research area. The Kappa accuracy has been measured at a value of 0.88 and an overall accuracy value of 0.90 which indicates that the LULC classification is done almost perfectly. This study offered information at the local level that farmers may utilize to decide on cropping patterns and appropriateness.

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