Forest cover change detection using Geo-informatics Technology: A Spatio-temporal Analysis based on Pottuvil and Thirukkovil Divisional Secretary Division in Ampara District, Sri Lanka

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Abstract

Forest resources are declining as the land use changes take place and there are several opportunities to tackle the emerging challenges to the forest cover when heading towards the integrated approach with the aid of geo-informatics technology. Therefore, this study is to detect the spatio-temporal changes in forest cover in Pottuvil and Thirukovil areas during the period from 2007 to 2020. The Landsat 7 ETM+ (Enhanced Thematic Mapper) imagery of 2007 and Landsat 9 OLI (Operational Land Imager) imagery of 2022 have been used to detect the forest cover changes with the aid of geo-informatics technology. According to the data validation, the overall accuracy was computed as 88.9% in 2007 and 89.6% in 2022. Also, the user accuracy is 80.4% in 2007 and 82.5% in 2022 as well as the producer accuracies for the years 2007 and 2022 are 90.1% and 91.0% respectively. As a result, in 2007, around 23,769 hectares of forest cover were identified in the study area. However, at the beginning of 2022, the forest cover decreased to 22,020 hectares which were therefore converted into Agricultural lands (1,709ha), Buildup lands (18ha.), Wetlands (7ha.), and Barren lands (16ha). It has also been found that the deforestation in this region, mostly due to the agricultural expansion is causing various challenges to ecology and biodiversity. Legal action should be taken against the increasing deforestation through concerned authorities and an integrated approach is vital to conserve the declining forest resources in the study area.

Keywords: Land use, Forest resource, geo-informatics, deforestation, ecology, biodiversity