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Vegetation Change Detection in Mullaitivu District by using Remote Sensing and GIS Techniques

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Abstract

Landuse and land cover change over time in the world due to uncontrollable rate of population growth and improper resource management which change the natural environment profoundly. Several studies were carried out on the land uses and land covers changes in Sri Lanka. However, little information available on land use and vegetation change in northern parts of the country. Therefore, the objective of the study is to detect the vegetation change in Mullaitivu district of Sri Lanka using Remote Sensing (RS) and Geographic Information System (GIS). In this study, multispectral remotely sensed data of Landsat was used to prepare the land use and land covermap on fourconsecutive years of 2013, 2014, 2016 and 2017. The vegetation change detection was assessed by applying ArcGIS 10.2 through unsupervised classification. Normalised Difference Vegetation Index (NDVI) was used to develop the land use map of the district. The results of this study revealed that areas under vegetation land use such as agriculture, sparse and plantation forest and dense forest were decreased from 2013 to 2017. Changed area of agriculture land use, sparse and plantation forest, and dense forest was 2.3%, 3.6% and 5.2%, respectively and these results showed that about 11% of deduction was observed by vegetation change. However, areas under buildup area was increased by 14% from 2013 to 2017. Area under dense forest was highly decreased followed by open and plantation forest and at the same time area under buildup was increased during same period. However, higher percentage of areas was negatively changed by dense and open-plantation forest. Similarly, higher percentage of areas was positively changed by buildup. These results were clearly indicated that areas under vegetation change was negatively correlated with areas under buildup change and vegetation was highly decreased due to the buildup activities. Therefore, existing policies and legislation should be strictly implemented and amended to conserve the forest in the study areas.

Keywords: GIS, Mullaitivu, NDVI, Remotes sensing, Vegetation change