

Studying the Dynamics of Wilpattu National Park, Sri Lanka Using Satellite Remote Sensing

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Forest is gift from nature and we depend on it for survival. Deforestation is foremost issue in the world. Identifying and monitoring of deforestation and forest degradation is a global requirement. When in view of current situation of Sri Lanka the deforestation is a leading problem. This study focuses on the Wilpattu national park and its changes during the time, which has grown into a level of a national crisis.

The rapid deployment of remote sensing satellites and techniques have provided a reliable, effective, and practical way to characterize terrestrial ecosystem properties. In this study a series of Landsat imagery (Landsat 2, 5 and 8) ranging from the year 1975 to 2015 have been used for the analysis. Initially, Support vector machine (SVM) based land cover classification was performed for all the images and the changes in the forest class was determined. Secondly Vegetation indices Normalize Difference Vegetation Index (NDVI), Normalize Difference Water Index (NDWI), Green Normalize Difference Vegetation Index (GNDVI) were used to separately extract the Vegetation, surface water and canopy conditions respectively. Also the social and natural components indication the other swaying factors for deforestation and once more impermeable the SVM result. Calculation of the deforestation and reforestation rate is based on predefined equations from FAO (Food and Agriculture Organization). Finally via Markov chain analysis for modeling future of forest. The projected land cover map demonstration the future of the forest in the year of 2050. The outcomes of this study reveal that there is a reforestation inside the national park (annual reforestation rate of 0.17%), while a deforestation outside close to the boundaries of it (annual deforestation rate of 0.29%).;

Keywords: FAO, GNDVI, NDVI, NDWI, SVM, Markov Chains