

## VEGETATIVE INDEX ASSESSMENT AND MONITORING OF OLUWA FOREST RESERVE ONDO STATE, NIGERIA

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### ABSTRACT

In recent time climate change mitigation has become a global challenge, and it is imperative to monitor one of the important forest reserves in Ondo State using three vegetative indices to determine its greenness, the depleting category, and forecast the future condition of the forest reserve area. This study aims to carry out vegetative index assessment and monitoring of Oluwa forest reserve. Especially, the study investigates vegetation cover that is conspicuous and responsible for the greenness of the forest reserve or otherwise and to also show the trend in vegetation indices changes in about three decades. Landsat imagery was downloaded for 1991, 2002, and 2018 while the Differential Global Positioning System (DGPS) in static mode was used to obtain the ground coordinate of some selected points in the study area to test the quality of the Landsat data. The shapefile of the study area was used in ArcGIS 10.4 environment for clipping and sub-setting while supervised classification and Maximum Likelihood algorithm were employed for vegetation classification. The Vegetative index method was employed to calculate and determine vegetation cover greenness for each year. Specifically, three different models of the vegetative index were used in the research which is Normalized Difference Vegetative Index (NDVI), Soil Adjusted Vegetative Index (SAVI), and Green Normalized Difference Vegetative Index (GNDVI). From the analysis carried out, this research reveals that the results obtained from SAVI was the most reliable as it has the highest accuracy when compared to NDVI and GNDVI. Furthermore, results from SAVI also showed that it represented the true condition of the study area and more realistic than the other two vegetation indices. Notably, the results of NDVI, SAVI, and GNDVI showed that the moderate Vegetation Index class (0.2 – 0.4) has the highest coverage area in Oluwa Forest Reserve, signifying that it contains more Shrub (bush) and grassland hence the greenness. The analysis also showed that the trend of dense vegetation (> 0.4) class (i.e. the class containing trees) showed a declining order as seen from SAVI result. This signifies that the rate at which dense vegetation (tress) is depleting without replacement is greater in Oluwa forest reserve area. The projection results for the three models showed that Dense vegetation will also be declining by the year 2030 and it is advised that Government should introduce stringent measures to protect the remnants of vegetation in Oluwa forest reserve for posterity sake.