

Mapping Deforestation by Multitemporal Data using Remote Sensing Technologies, Sinop-Turkey Case Study

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SUMMARY

Forests are playing significant role not only animals but also for humans and their following generation in terms of ecological issues. In the last two decades, deforestation and forest degradation issues have increased. Since 1960s' over the half of the tropical forests have been destroyed and deforestation rate has been increased rapidly. In the last decade, 13 million of ha/year of forests have been deforested in the world and the rate of the forest degradation is extremely high.

This paper intends to map Land Use Land Cover (LULC) changes and forest degradation derived from Landsat satellite images using remote sensing technologies. For this aim, Sinop province of Turkey was selected as the case study area. Sinop province is located among Turkey's most northern tip Inceburun which is surrounded by Kastamonu in the west, Çorum in the south, Samsun in the east and Black Sea in the north. The city is situated between 34°13'59.73" - 35°27'17.83" Eastern Meridians and 41°42'32.61" - 41°20'19.68" Northern Parallels with an altitude of 25m. above sea level.

LULC changes and forest degradation have been studied using Landsat data sets between the years 1987-2019. 3 Landsat 5 TM imageries were dated 27 July 1987, 06 July 1997 and 16 June 2007 and 2 Landsat 8 OLI/TIRS imageries were dated 13 July 2017 and 10 July 2019. In this context, Support Vector Machine algorithm which is the most trusted supervised classification method and Normalized Difference Vegetation Index (NDVI) were applied to all Landsat data to demonstrate forest and built-up changes in every decade. Seven land use classes were selected which were; Waterbody, agriculture, sand, built-up areas, vegetation, forest and bare soil/rock. Noteworthy changes were observed in the classes of built-up areas and forest from the year of 1987 to 2019. Besides, accuracy assessments were carried out and the kappa statistics for Landsat 5 and Landsat 8 data were calculated 0.94, 0.99, 0.89, 0.98 and 0.99 respectively. Unfortunately, in the case study area, forest degradation will be continued due to the installation of nuclear power plant station in the following years.

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