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Monitoring land use change, structure and diversity analysis of dry tropical forests of central India using remote sensing and GIS techniques

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Vegetation structure and species composition are the most important ecological attributes of forest ecosystems. The present study was carried out to characterize the land use, vegetation structure, diversity, herbaceous biomass in the dry tropical forest in Achanakmaar Amarkantak Biosphere Reserve of India using satellite remote sensing techniques and GIS. Land cover and vegetation were spatially analyzed by digitally classifying Landsat 8 satellite data using maximum likelihood algorithm. Later, the variations in structure, composition, diversity, herbaceous biomass in different forest types/classes were quantified by adopting quadratic sampling procedures. Seven land cover types viz. Teak forest, Dense mixed forest, Degraded mixed forest, Sal mixed forest, Open mixed forest, Agriculture & habitation and water bodies were delineated. This study observes that the use of GIS and Remote Sensing in mapping Land Use/ Land Cover between 2007 and 2017 so as to detect the changes that has taken place in this status between these periods. For this study two sets of satellite images of the year 2007 and 2017 were used. The classification accuracy for different land use classes ranged from 63.23-100 %. The highest accuracy was observed in water bodies followed by Habitation & Agriculture, Teak forest, Degraded mixed forest and Dense mixed forest. The study indicates adopting the intensive conservation measures, especially in open forest and immature under-stocked teak plantations. Encouraging and improving Sal regeneration in Sal mixed forests will help in reducing the biotic pressure and also in restoring and conserving the fragile forest ecosystems of India and mitigating the global warming and climatic change.

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