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Estimation of Invasive *Prosopis juliflora* in Bundala National Park, Sri Lanka using GIS and Remote Sensing Techniques**Sandaruwan R.D.C.^{1*}, Dissanayake P.A.K.N.², Sandamali K.U.J.³, Rajapaksha J.K.⁴**

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Abstract

Prosopis juliflora is an invasive species that exhibits an aggressive growth pattern in a short period by affecting the native communities. It had been introduced to the Hambanthota District in Sri Lanka in the 1950s for stabilizing salt-affected soil in the coastal area. Consequently, the plant had invaded the Bundala National Park, the first RAMSAR site of the country by threatening the biodiversity. However, information is lacking on distribution and its impacts on the environment. Thus, this study was conducted to address the data gap by estimating the spatial and temporal distribution of *P. juliflora* in Bundala National Park using GIS and Remote Sensing. Landsat satellite images were used from 1988 to 2021. The principal component analysis method was used for band selection while ArcMap 10.3.1 software was utilized for the analysis. Iso Cluster Unsupervised Image Classification was used to calculate the temporal and spatial distribution of *P. juliflora*. The accuracy was assessed by collecting real-time ground truth data integrated with Google Maps. According to the findings, *P. juliflora* increased by ~60% in the entire park from 1988 (9.4 km²) to 2016 (32.9 km²). The grazing and loitering of animals may be one reason for the colonizing of the plant including in water-logged areas. Further studies are recommended to assess the impacts on the local populations by monitoring the dispersal patterns of the plant, which is requisite for the better management of the park. In addition, eco-friendly and cost-effective methods must be adopted to control the existing pockets.

Keywords: *Prosopis juliflora*, Invasive species, Bundala national park, GIS, Remote sensing