

Satellite Remote Sensing Observations of the Changes of Night Lighting in the Hambantota Area

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Excessive light during the nighttime affects wildlife and influences human health. However, studies that used remote sensing data to report light pollution are sparse in the world. This study attempts to investigate the spatial distribution and temporal changes of nighttime light intensities in a rapidly urbanizing area of Hambantota district, Sri Lanka. An intensification of anthropogenic activities and changes in land uses were evident in the area with several major development projects including the Hambantota harbor. The study area includes a portion of Bundala National Park (NP), the first Ramsar wetland in Sri Lanka which accommodates high biodiversity. Remote sensing data from the Daily Moonlight-adjusted Nighttime Lights product (VNP46A2) of the Black Marble product suite developed by NASA was used to analyze light intensities from 2012 to 2018. Nighttime light was analyzed based on digital number (DN) values representing brightness. This study is the first detailed investigation in Sri Lanka that reports nighttime light intensities using remote sensing data. Light intensities peaked in 2014 suggesting a rapid intensification of anthropogenic activities where over 83% of the total land had experienced an increment in the light intensity. From 2014 to 2018, a significant fall in light intensity was observed. These changes could be attributed to the onset of seaport development, which was fully functioning in 2014, and its subsequent halt in operation from 2014 – 2018. Increased lights towards the coastal areas and the western edge of Bundala NP could affect wildlife, especially nocturnal animals, birds, and turtles.

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