

Spatio-temporal changes in mangrove cover of three lagoons in Southern Sri Lanka during the last two decades: A field validated GIS study

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Considerable changes in the mangrove cover of Rekawa (6°02'57"N, 80°50'37"E), Kahandamodara (6°04'02"N, 80°53'12"E), and Kalametiya, (6°05'37"N, 80°56'26"E), three neighboring lagoons of southern Sri Lanka, taken place during the period from 1956 to 1994 were reported by Dahdouh-Guebas F et al., (2005) with implications for further changes in the future. Therefore, this study was aimed at investigating spatio-temporal changes in the mangrove cover of the same three lagoons during the last two decades, from 1994 to 2016. First, eight aerial photographs of 1994 and Landsat-8 image of 2016, covering the three lagoon areas were geo-referenced using respective toposheets of the lagoons (ArcGIS v.10.1). Spatio-temporal changes of mangrove cover and water surface area of each lagoon during the 22 year period were quantified by overlaying the maps. Changes were field validated and possible causes for the changes were studied by on-site observations and through information collected using a questionnaire survey. All three lagoons showed significant increases in mangrove cover from 1994 to 2016. Mangrove covers of Rekawa, Kahadamodara and Kalametiya lagoons have been increased by 17.86% (1.05 ha yr⁻¹), 19.04% (1.44 ha yr⁻¹) and 144.34% (10.35 ha yr⁻¹) respectively, during the last 22 year period. Accordingly, surface water areas of respective lagoons have decreased by 1.20%, 11.90% and 72.43% during the same period. The results indicate that rates of increase of the mangrove cover of the three lagoons for the period from 1994 to 2016 have been accelerated compared to that of the rates from 1956 to 1994. Possible reasons for the changes are discussed.

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