

Land-use/cover changes in the city of Hambantota, Sri Lanka, over the past two decades – a field validated GIS study

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The city of Hambantota has been gaining attention with establishment of a new airport nearby and a sea port as well as many other accelerated and rapid development projects after the devastation of the city by Tsunami in 2004. As such development activities could disturb equilibrium among socio-economic status, ecosystem functioning and services of an area, it is worth to study such impacts and the quantification of land cover/use changes in the area is a pre-requisite for such studies. Hence, the land-use/cover changes of the Hambantota city area were studied using remotely sensed maps of 1996 and 2016. Hambantota city was defined in the 2013 city map of Sri Lanka published by the Survey Department and all adjacent Grama Niladhari divisions were also taken as the study area. Google earth 2016 images were transferred and geo-referenced in ArcGis 10.1 interface. Different land-uses were mapped, and a proper field validation was done including a questionnaire survey. The 2016 map was overlaid with 1996 land-use map of the area obtained from the Survey Department. Area estimations were done for each land-use class in both maps followed by an area loss/gain analysis. Results show that structural complexity and patch density (PD) of urban land-use have been significantly increased. For example, PD in 2016 is three times larger compared to 1996 and settlements have increased by ~15% (579.2 ha) replacing scrublands, chena and dry forests [reduction by ~21% (834.8 ha)] in Hambantota city area. This indicates rapid physical development, but a loss in the green cover has also taken place simultaneously. Moreover, cultivations have also increased by 8.2% (318.4 ha) replacing scrublands. A considerable area of saltpan (201.6 ha) has been lost due to construction of Hambantota port and the remaining area has now become non-functional. Therefore, the trajectory of spatio-temporal changes may indicate that Hambantota is moving away from 'green city' status. Hence, immediate reforestation and environment protection policy enforcement are utmost important.

Keywords: *Urbanization, land-use/cover, spatio-temporal changes, sustainability, settlements*

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