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Application of the City Biodiversity Index: A Sri Lankan Case Study

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Abstract

Rapid urbanisation has inevitable impacts on the local biodiversity, ecosystems and ecosystem services, providing both challenges and opportunities to manage them. Assessing the status and trends of biodiversity and ecosystem services in urban landscapes is highly important in understanding whether a metropolitan area is developing on a sustainable trajectory. However, in accomplishing this task, both policy makers and scientists alike, are faced with unique methodological (scaling, boundaries, definitions) and institutional level (integrating biodiversity and ecosystems with social and economic goals) challenges. The recently developed City Biodiversity Index (CBI), *alias* Singapore Index on Cities' Biodiversity or the Singapore Index (SI) has become increasingly recognized as a useful tool in assessing the status and trends of biodiversity in urban landscapes. In this study, we report the outcomes of the first application of CBI in the Sri Lankan context to evaluate the biodiversity conservation status and trends in the municipality of Galle, Southern Province of Sri Lanka. The assessment was carried out following the 23 indicators specified in the User's manual on the Singapore Index on Cities' Biodiversity for the period 2012-2015. Ecological and socio-economic data for the assessment were predominantly acquired from published literature, and government and non-government institutes. Field verifications of ecological and socio-economic data were conducted in cases where there were information gaps. Standard ecological census techniques, GIS-based analysis, stakeholder interviews and questionnaire surveys were employed in this process. The application of CBI to the Galle City resulted in a cumulative score of 43 out of 92 possible points (14/40 for the native biodiversity in the city, 10/16 for ecosystem services provided by biodiversity, and 19/36 for the governance and management of biodiversity). Our analysis revealed that native biodiversity component indicated by the proportion of natural areas in the Galle City is high compared to built-up areas. Related indicators further suggested that Gall City at present supporting a moderate level of native biodiversity. It was further observed that the richness of invasive alien species and introduced plant species in the city have increased from 2012 (baseline year) to 2015. The permeable area and the tree canopy cover extent were found to be 81.29% and 60.81% of the total city land area respectively. As such, ecosystem services component of the CBI reported a higher score. The index further suggest that the Galle City require improvements in terms of governance and management of biodiversity, though there were many agencies exist for biodiversity conservation. In general, biodiversity education (outside schools level), absence of active government and private agencies for biodiversity conservation and sufficient budgetary allocations for city biodiversity management were found to be the major drawbacks in governance and management of city biodiversity. Outcomes of this study provide important information for integrated urban city planning and policy reforms.

Keywords: Urban biodiversity, Ecosystem Services, Urbanisation, CBI, Galle City

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