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Understanding Governance of Biodiversity-Supporting and Edible Landscapes Using Network Analysis in a Fast Urbanising City of South India

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Abstract : Sustainable smart cities are emerging as an important concept in response to the exponential rise in the world's urbanizing population. While earlier, only technical, economic and governance based solutions were considered, more and more layers are being added in recent times. With the prefix of 'sustainability', solutions which help in judicious use of resources without negatively impacting the environment have become critical. We present a case study of Bangalore city which has transformed from being a garden city and pensioners' paradise to being an IT city with a huge, young population from different regions and diverse cultural backgrounds. This has had a big impact on the green spaces in the city and the biodiversity that they support, as well as on farming/gardening practices. Edible landscapes comprising farms lands, home gardens and neighbourhood parks (NPs henceforth) were examined. The land prices of areas having NPs were higher than those that did not indicate an appreciation of their aesthetic value. NPs were part of old and new residential areas largely managed by the municipality. They comprised manicured gardens which were similar in vegetation structure and composition. Results showed that NPs that occurred in higher density supported reasonable levels of biodiversity. In situations where NPs occurred in lower density, the presence of a larger green space such as a heritage park or botanical garden enhanced the biodiversity of these parks. In contrast, farm lands and home gardens which were common within the city are being lost at an unprecedented scale to developmental projects. However, there is also the emergence of a 'neo-culture' of home-gardening that promotes 'locovory' or consumption of locally grown food as a means to a sustainable living and reduced carbon footprint. This movement overcomes the space constraint by using vertical and terrace gardening techniques. Food that is grown within cities comprises of vegetables and fruits which are largely pollinator dependent. This goes hand in hand with our landscape-level study that has shown that cities support pollinator diversity. Maintaining and improving these man-made ecosystems requires analysing the functioning and characteristics of the existing structures of governance. Social network analysis tool was applied to NPs to examine relationships, between actors and ties. The management structures around NPs, gaps, and means to strengthen the networks from the current state to a near-ideal state were identified for enhanced services. Learnings from NPs were used to build a hypothetical governance structure and functioning of integrated governance of NPs and edible landscapes to enhance ecosystem services such as biodiversity support, food production, and aesthetic value. They also contribute to the sustainability axis of smart cities.

Keywords : biodiversity support, ecosystem services, edible green spaces, neighbourhood parks, sustainable smart city
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