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Co-Evolution of Urban Lake System and Rapid Urbanization: Case of Raipur, Chhattisgarh

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Abstract : Raipur is known as a city of water bodies. The city had around 200 man-made and natural lakes of varying sizes. These structures were constructed to collect rainwater and control flooding in the city. Due to the transition from community participation to state government, as well as rapid urbanisation, Raipur now has only about 80 lakes left. Rapid and unplanned growth has resulted in pollution, encroachment, and eutrophication of the city's lakes. The state government keeps these lakes in good condition by cleaning them and proposing lakefront developments. However, maintaining individual lakes is insufficient because urban lakes are not distinct entities. It is a system comprised of the lake, shore, catchment, and other components. While Urban lake system (ULS) is a combination of multiple such lake systems interacting in a complex urban setting. Thus, the project aims to propose a co-evolution model for urban lake systems (ULS) and rapid urbanization in Raipur. The goals are to comprehend the ULS and to identify elements and dimensions of urbanization that influence the ULS. Evaluate the impact of rapid urbanization on the ULS & vice versa in the study area. Determine how to maximize the positive impact while minimizing the negative impact identified in the study area. Propose short-, medium-, and long-term planning interventions to support the ULS's co-evolution with rapid urbanization. A complexity approach is used to investigate the ULS. It is a technique for understanding large, complex systems. A complex system is one with many interconnected and interdependent elements and dimensions. Thus, elements of ULS and rapid urbanization are identified through a literature study to evaluate statements of their impacts (Beneficial/ Adverse) on one another. Rapid urbanization has been identified as having elements such as demography, urban legislation, informal settlement, urban infrastructure, and tourism. Similarly, the catchment area of the lake, the lake's water quality, the water spread area, and lakefront developments are all being impacted by rapid urbanisation. These nine elements serve as parameters for the subsequent analysis. Elements are limited to physical parameters only. The city has designated a study area based on the definition provided by the National Plan for the Conservation of Aquatic Ecosystems. Three lakes are discovered within a one-kilometer radius, establishing a tiny urban lake system. Because the condition of a lake is directly related to the condition of its catchment area, the catchment area of these three lakes is delineated as the study area. Data is collected to identify impact statements, and the interdependence diagram generated between the parameters yields results in terms of interlinking between each parameter and their impact on the system as a whole. The planning interventions proposed for the ULS and rapid urbanisation co-evolution model include spatial proposals as well as policy recommendations for the short, medium, and long term. This study's next step will be to determine how to implement the proposed interventions based on the availability of resources, funds, and governance patterns.

Keywords : urban lake system, co-evolution, rapid urbanization, complex system
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