Urban Wetland Monitoring Using GIS Technology in the NCT of Delhi

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Abstract: Wetlands are part of the natural landscape and are defined by the presence of water. According to the recent findings of the Millennium Ecosystem Assessment (as reported to the Ramsar Convention), the ecosystem services provided by wetlands are much more valuable than previously conceived. Despite this, the ecosystem services provided by wetlands--such as water purification, recharge of ground water, flood control, habitat for biodiversity, aesthetic and cultural value--are either not understood or not given the attention required for their conservation. The situation is even more complex in the case of urban wetlands which are located on 'prime lands' of high economic value. Consequently, policy makers and urban planners often overlook the economic importance of wetlands during the decision making process resulting in the rapid extinction of wetlands in urban areas. The lack of understanding and recognition of urban wetlands further leads to ill-informed decision making which enhances the continuing rapid loss and degradation of wetlands in urban areas. There is thus an urgent need to monitor and conserve wetlands while also evaluating and highlighting their economic benefits to the society.

Urban wetlands located in the National Capital Territory (NCT) of Delhi are also facing a similar pressure. The total number of wetlands in Delhi exceeded 1,000 until a few decades back. The Delhi Climate Action Plan (2009) includes a listing of wetlands in Delhi and reports the occurrence of only 621 wetlands, many of which are already dry or beyond recovery. The total number of wetlands in Delhi, as reported by the National Wetlands Atlas of India (2011) is less than half this number. It needs to be mentioned here that the reduction in the number of wetlands in Delhi is simultaneous along with the declining ground water level in Delhi city. The South and South-west districts in Delhi are the worst affected in terms of declining ground water levels and wetlands could actually play a role in recharging the ground water in this region. Protection and conservation of urban wetlands in Delhi is therefore the need of the hour and requires concerted and inter-disciplinary efforts. The first step in this direction is to prepare an inventory and monitor the performance of existing wetlands, before we can begin their conservation.

The present research contribution attempts to use Geographic Information System (GIS) technology and prepare an interactive web-based inventory of wetlands in the NCT of Delhi. The initial data on the name and number of wetlands is obtained from the Department of Environment, Govt. of NCT of Delhi and the

wetlands are first located using GPS/ satellite imagery. Some important wetlands among these are selected for the present study and a vulnerability assessment is carried out for the same. The web-based inventory can be periodically updated using GIS and all wetlands are displayed on a map so as to help citizens connect to the wetlands located in their immediate vicinity. We show how GIS technology can play a significant role in both environmental management and also in environmental protection through citizen engagement and participation.

Keywords: wetlands, ecosystem services, wetland monitoring, GIS

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