

EGU2020-945

<https://doi.org/10.5194/egusphere-egu2020-945>

EGU General Assembly 2020

© Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.



Hydrogeochemistry of Urban Wetlands of Delhi, India

Purna Joshi and Neelam Siva Siddaiah

SCHOOL OF ENVIRONMENTAL SCIENCES, JAWAHARLAL NEHRU UNIVERSITY, New Delhi, India (parthprerna@gmail.com)

Delhi, India's capital is the second largest urban agglomeration in the world. It is expected to surpass Tokyo to become world's largest city by 2028 with ~37 million inhabitants (UNDESA, 2018). This rapid growth is characterized by unsystematic urbanization, rapid shifts in its landuse patterns and tremendous pressure on the city's natural resources. Among other forms of resource degradation, rapidly shrinking and stinking wetlands are of primary concern. Thus evidence-based policy making for their sustainable development and conservation require regular reporting and monitoring of their status.

Present study compares the hydrochemistry of two urban wetlands of Delhi (Sanjay lake and Bhalswa lake) having some crucial differences in their nature and catchment area activities. Surface water quality of these wetlands was studied for winter and summer with respect to their physico-chemical properties (temperature, pH, dissolved oxygen, electrical conductivity, total dissolved solids, alkalinity and hardness) including major ions and trace metals employing standard analytical methods (APHA, 2005). Waters from both the wetlands are alkaline in nature. While pH of Sanjay lake shows a greater variation (7.9 to 10.8), that of Bhalswa lake is fairly constant (8.4 to 8.7), across the seasons. The wetland waters also vary seasonally in their chemistry. Differences in the nature and associated landuse of the wetlands is reflected in their water quality. Hydrogeochemistry of these wetlands were determined by Piper plot and Gibb's diagram. While water from both the wetlands are Na^+ - SO_4^{2-} type during summer, water from Bhalswa lake is Na^+ - SO_4^{2-} type and that from Sanjay lake is Ca^{2+} - Mg^{2+} - SO_4^{2-} type during winter. While water from Bhalswa lake shows an evaporation dominance regime, that from Sanjay lake show dominance of rock-water interaction. Water from both the wetlands are generally unsuitable for drinking purpose. While water from Bhalswa lake is unsuitable for irrigation as well, water from Sanjay lake is generally suitable as determined using various indices (% Na, Residual Sodium Carbonate, Sodium Absorption Ratio, etc.). Both the drinking and irrigational water quality of these wetlands deteriorate during summer. Factor analysis was also used to determine sources of pollution for the two wetlands during both winter and summer. Domestic sewage is observed to be a major source of pollution for both the wetlands. Thus, this study indicates that urban wetlands of Delhi are fast depleting in their health. In light of their importance as a significant urban water resource, a crucial ecological niche and an essential recreational spot for urban areas, there is an urgent need for positive interventions.