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"Filling gaps and removing traps
for sustainable resource management"

Impact of Urbanisation on Water Bodies in Agro-Ecosystems of Bengaluru-Metropolitan City of India

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Abstract

Water contamination is one of the many consequential concerns of urbanisation that need immediate attention in most cosmopolitan cities. In Bengaluru, one of the fast growing metropolitan cities in India, most of the water bodies are contaminated. However, under unabated, rapid land use changes and severe water scarcity, it is inevitable to utilise the available water for all possible uses depending on the quality of water. Thus it is critical to ascertain the extent of as well the source of contamination. Among the various causes of contamination agriculture is one of the major factors. Due to urbanisation agriculture has undergone changes in and around Bengaluru in terms of crops grown as well as cultivation practices. This study is an attempt to assess the changes in the agro-biodiversity related water quality in the agro-ecosystems along rural urban transition zones (RUT) of Bengaluru. In this study suitability of water for major utilities such as drinking, irrigation and for livestock use is assessed. Water quality is determined based on specific physical, chemical and biological indicators in ground water (n=30) as well as surface water (n=30) bodies located within one kilometer radius of agriculture lands. The mean water quality index (developed based on 22 water quality parameters) of urban surface and ground water suggest that it is not suitable for drinking but, fairly suitable for irrigation and industrial use (C3 and C4 category), while in the transition and rural area it is again not suitable for drinking purpose but suitable for irrigation and industrial use (C2 category). Piper tri-linear diagram indicate that majority of the ground and surface water samples belong to mixed Ca^{2+}–Mg^{2+}– Cl^{-}–$SO_2{}^{4-}$ type, and continuous use of this water in future may lead to soil degradation and crop damage. Results indicate that water quality across the RUT of Bengaluru is deteriorating and hence there is an immediate need for improving the water resource management.

Keywords: Agro-ecosystems, drinking standards, irrigation quality, livestock quality, urbanisation, water quality Index

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