Challenges of EDCs in riverine and marine ecosystems of India : a cost-effective sustainable solution

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India is a predominantly agrarian economy and rapidly industrializing. Endocrine-disrupting chemicals (EDCs) different category of chemicals viz., pesticides, several plastic additives, and pharmaceutical and personal care products that are widely manufactured and used in India can interfere with the hormonal systems and impact human health. The increasing influx of EDCs in the riverine and marine ecosystems calls for novel conceptual and methodological approaches to relating chemical pollution and ecological alterations in the ecosystems and biota. Myriad sources of EDCs in the Indian river basins are open burning of dumped solid waste, leaching from mismanaged plastic waste, and direct discharge of wastewater from open drains (Chakraborty et al., 2021a; Mukhopadhyay and Chakraborty, 2021; Rex and Chakraborty, 2022). Untreated municipal waste including waste plastic, industrial, healthcare, and agricultural runoffs contribute emerging contaminants in the riverine and marine environments. River sediments acts as a repository for most organic pollutants, releasing these contaminants with water, aquatic animals and also air. Under the high-temperature regime in most part of India, semi-volatile EDCs become suspended in the atmosphere and remain aloft for a considerable period of time (Chakraborty et al., 2021b). Southwest monsoon-driven atmospheric deposition and surface runoff drain EDCs into river systems (Khuman and Chakraborty, 2019; Arun et al., 2022). Meltwaters drains EDCs in the river bodies during warmer months (Snow et al., 2020). Finally, wetlands and open oceans act as the sink for several persistent EDCs (Chakraborty et al., 2021). Even in trace levels, the parent chemicals or their metabolites can pose a severe deleterious impact on human health (Chakraborty et al., 2021a). Hence for a developing economy, like India we are working on cost-effective sustainable solutions to remove EDCs from water and wastewater. We have developed a prototype comprising of sustainable materials that are efficient, economic, environmentally friendly, and socially acceptable real-scale environmental applications leading to a circular economy loop. Our integrated constructed wetland system augmented with nano-composites and microbial consortia; "**MANTRA-POT**" can effectively remove EDCs from wastewater. **MANTRA-POT** can help improve access to clean water and sanitation even for marginalised communities.

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