Title: Performance evaluation of mohara water treatment plant: High efficiency in pollutant removal and adherence to water quality standards

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Abastact: This study assessed the performance of the Mohara Water Treatment Plant (MWTP) by evaluating the efficiency of individual treatment units and their pollutant removal capacities. The investigation also examined heavy metal concentrations in raw and treated water and applied the heavy metal pollution index (HPI) to assess overall water quality. Key parameters analyzed included turbidity, total suspended solids (TSS), ammonia, chemical oxygen demand (COD), total coliform, and fecal coliform. The results indicated notable differences between raw and treated water, and removal efficiencies differed across treatment units such as primary sedimentation, clarification, filtration, and disinfection. Average removal efficiencies ranged from 99.67% ± 0.02–99.84% ± 0.03% for turbidity, 99.54% ± 0.03–99.79% ± 0.04% for TSS, 89.07% ± 6.95–100% for ammonia, and 95.73% ± 0.52–97.11% ± 0.21% for COD, while total coliform and fecal coliform were completely removed. Descriptive statistics represent the minimum and maximum monthly overall removal efficiencies calculated from monthly mean concentrations obtained from replicate high- and low-tide samples. Measured concentrations of Fe, Mn, Zn, Cu, Pb, Cd, Cr, Hg, and As complied with the limits set by the Environment Conservation Rules (ECR) (2023). Pb, Cd, Cr, and Hg were below instrumental detection limits, and As was undetectable using the As test kit. The HPI values for raw (17.58) and treated (11.05) water were well below the critical limit of 100 for potable water. Overall, the findings demonstrate MWTP's effectiveness in producing safe drinking water and contribute toward achieving Sustainable Development Goal 6.

Keywords: MWTP Efficiency, HPI Water, quality, Bangladesh

10.1016/j.scowo.2026.100212

https://www.sciencedirect.com/science/article/abs/pii/S2950357426000314