

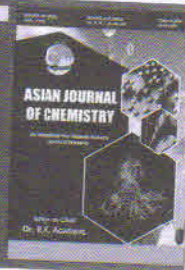


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## MINI REVIEW

### Current Status and Key Challenges of Water Quality in the Olifants and Orange-Vaal River Systems, South Africa

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This comprehensive review assesses the water quality in South Africa, with a specific focus on the Olifants and Orange-Vaal River systems. Both rivers serve as vital water sources for domestic, agricultural and industrial purposes but face significant pollution challenges. This review integrates findings from recent peer-reviewed studies to characterize the dominant sources of contamination, evaluate their impacts on aquatic ecosystem integrity and assess associated risks to human health. It further outlines a suite of targeted, evidence-based recommendations to enhance water quality management within the Olifants and Orange-Vaal River catchments. These recommendations include implementing integrated and adaptive water resources management frameworks, expanding advanced monitoring, modelling and early-warning systems, strengthening regulatory enforcement, enhancing public environmental literacy, and improving coordination among government, industry and civil society. Collectively, the findings highlight the pressing need for coordinated, long-term interventions to protect South Africa's freshwater systems under intensifying anthropogenic pressures and projected climate-change impacts.

**Keywords:** Surface water quality, Pollution sources, Ecological impact, Health impact, Orange-Vaal river, Olifants river.