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State of surface water quality: case of Gargar dam waters

Cheikh Bergane^{1,*}

¹Laboratoire de Rhéologie, Transport et Traitement des Fluides Complexes, Université des Sciences et de la Technologie d'Oran – Mohamed Boudiaf-, Oran, Algeria

*Correspondence: Cheikh Bergane - E. mail: cheikh.bergane@univ-usto.dz

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Abstract

Anthropogenic activities alter the quality of surface waters and promote an increase in organic pollution. The Gargar dam, located 5 km southwest of the city of Oued Rhiou in Relizane province, exemplifies this situation. A time series analysis of 10 physicochemical parameters indicative of organic pollution was conducted in the Gargar dam watershed, part of the larger Chellif Zahrez watershed. This study aimed to diagnose the temporal evolution of water pollution, regardless of its origin. Significant trends and seasonality were assessed using appropriate statistical tests. The results revealed statistically significant increases in pH, nitrates, nitrites, phosphates, BOD₅, COD, and the volume of water stored in the dam, indicating a substantial rise in pollution. Conversely, dry residue, dissolved oxygen, ammonium, and organic matter showed no significant trends. The Webel-Ollech test indicated no seasonality for any of the parameters. Most parameters did not meet regulatory standards for surface water quality. The COD/BOD₅ ratio suggests that 70.37% of the dam's water contains a significant amount of recalcitrant organic matter. The main sources of water quality degradation were identified as domestic wastewater discharges, agricultural runoff, and industrial waste from the Si Haoues unit. This study highlights the urgent need for sustainable management strategies to address water pollution in the Gargar dam.

Keywords: *Surface Water Pollution, Gargar Dam, Statistical Tests, COD/BOD₅ Ratio*