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REVIEWER'S REPORT

Manuscript No.: **IJAR-53391** Date: 19-08-2025

Title: Physicochemical quality of water and sediments of lake hlan in southern Benin

Recommendation:
Accept as it is .....YES.....
Accept after minor revision.....
Accept after major revision .....
Do not accept (*Reasons below*) .....

Rating	Excel.	Good	Fair	Poor
Originality		✓		
Techn. Quality		✓		
Clarity	✓			
Significance		✓		

Reviewer Name: Mir Tanveer

Reviewer's Comment for Publication.

General Assessment:

The manuscript addresses a highly relevant environmental issue concerning the degradation of aquatic ecosystems under anthropogenic pressures. The focus on Lake Hlan, a water body of local and ecological importance in southern Benin, provides valuable insights into the interactions between human activities and water resource quality. The study integrates both social and natural science perspectives by combining field surveys with physicochemical and sediment analyses, which strengthens its interdisciplinary relevance.

Originality and Relevance:

The research is original in its choice of study site, Lake Hlan, which appears to be under-researched in the scientific literature. Its contribution lies in assessing both water and sediment quality while situating these within the context of local socio-economic activities. The findings are significant because they highlight environmental risks that threaten both biodiversity and human well-being.

Clarity and Structure:

The manuscript is clearly structured with an abstract that effectively summarizes the aim, methodology, and findings. The introduction provides a well-developed background, situating

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the research within the broader problem of water pollution in Benin and globally. The text is coherent and readable, with logical progression from problem statement to research objectives.

Methodology:

The methodological approach is described in detail and includes documentary research, surveys among the local population, sampling of water and sediments, laboratory analyses, and interpretation of data. The triangulation of methods enhances the reliability of the findings. The socio-economic survey results are systematically presented and linked to environmental outcomes.

Results and Discussion:

The results highlight clear links between local anthropogenic activities—such as agriculture, palm nut processing, fishing, and animal breeding—and the physicochemical quality of the lake. The study emphasizes nutrient pollution (phosphates and ammonium) as well as elevated concentrations of heavy metals (lead and cadmium) in sediments, which surpass international standards for aquatic life. The discussion situates these findings within the broader context of human impacts on aquatic ecosystems, underlining the vulnerability of Lake Hlan.

Scientific Contribution:

The study contributes valuable data on physicochemical parameters of both water and sediments, with implications for aquatic biodiversity conservation and public health. It demonstrates how local socio-economic practices directly translate into environmental pressures, thereby reinforcing the importance of integrated water resource management.

Language and Presentation:

The language is clear and accessible, with scientific terminology appropriately used. The manuscript maintains an academic tone throughout and is adequately referenced with relevant literature.

Conclusion:

Overall, this manuscript provides a significant contribution to the field of environmental sciences and water resource management. It successfully combines empirical data with socio-environmental analysis to present a comprehensive understanding of the environmental challenges facing Lake Hlan.

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