ISSN: 2320-5407

# International Journal of Advanced Research

**Publisher's Name: Jana Publication and Research LLP**

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## REVIEWER'S REPORT

Manuscript No.: IJAR-51791 Date: 23 -05-2025

**Title: ESTIMATION OF POLLUTANT FLOWS IN THE SO AND DJONOU RIVERS TRIBUTARY TO LAKE NOKOUE IN WEST AFRICA**

**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's Name:** Tahir Ahmad

**Reviewer's Decision about Paper:** **Recommended for Publication.**

**Comments** (*Use additional pages, if required*)

## *Reviewer's Comment / Report*

**Title Evaluation:**
The title clearly reflects the geographical and thematic focus of the study. It effectively conveys the core subject—pollutant flow estimation—and specifies the rivers and lake under investigation, which is appropriate for a technical environmental research context.

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**Abstract Assessment:**
The abstract concisely outlines the purpose, methodology, and key findings of the research. It mentions the analytical techniques used—molecular and atomic absorption spectrometry—as well as the sources of hydrological data. Quantitative results are clearly presented for both the Djonou and Sô rivers, highlighting specific pollutants and their estimated flows. The conclusion emphasizes the urgency of mitigation efforts to prevent ecological degradation of Lake Nokoué. Overall, the abstract is informative, scientifically rigorous, and consistent with standard academic expectations.

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**Introduction Quality:**
The introduction is well-structured and provides a comprehensive overview of the environmental, demographic, and industrial context surrounding Lake Nokoué. It situates the study within a broader framework of anthropogenic impacts, including domestic waste, industrial discharge, agriculture, and petroleum-related pollution. Historical and regional data are cited effectively to support the relevance and urgency of the study. The inclusion of multiple sources (e.g., INSAE, Lalèyè et al., Tossou, Kouchade) enriches the contextual understanding and establishes a strong foundation for the research.

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**Scientific and Methodological Rigor:**
The study demonstrates a clear application of validated scientific methodologies for pollution flow estimation. The use of spectrometric techniques to quantify pollutants ensures analytical precision. Furthermore, the integration of hydrological data from IRHOB and other instruments (e.g., ADCP and current meter) adds robustness to the flow estimation. The reference to the U.S. EPA's method (1986) grounds the methodology in established international standards. The analysis spans a 12-month period, allowing for seasonal variation capture, which is a notable strength in environmental monitoring.

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**Data Presentation and Interpretation:**
The results section within the abstract presents detailed pollutant load values (e.g., BOD, COD, nitrates, heavy metals) for each river. The differentiation between the types of pollution (organic, nitrogenous, metallic) and their respective sources demonstrates a nuanced understanding of the tributary-specific impacts. The explicit mention of pollutant flow rates in kilograms per day provides a clear metric for environmental assessment.

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**Relevance and Implications:**
The study offers critical insights into the environmental pressures faced by Lake Nokoué, one of West Africa's most productive water bodies. By identifying and quantifying the major pollutants entering the lake through its tributaries, this research serves as a valuable tool for environmental management, policymaking, and targeted intervention. The emphasis on the need for short-, medium-, and long-term mitigation strategies highlights the practical significance of the findings.

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**Overall Evaluation:**
This manuscript is scientifically sound, contextually rich, and highly relevant to environmental science and water resource management in West Africa. It demonstrates methodological precision, clarity in data reporting, and a well-articulated rationale. The study's contribution to understanding pollutant dynamics in the Sô and Djonou rivers positions it as a valuable resource for stakeholders concerned with the health of Lake Nokoué and the broader ecological system.