

REVIEWER'S REPORT

Manuscript No.: IJAR- 58399

Title: Impacts invisibles de l'utilisation des intrants chimiques sur la qualité des eaux de surface dans un bassin versant tropical en Guinée,

Recommendation:

Accept after minor revision

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

Reviewer's ID: Abdul Haseeb Mir

Detailed Reviewer's Report

The manuscript entitled "Impacts invisibles de l'utilisation des intrants chimiques sur la qualité des eaux de surface dans un bassin versant tropical en Guinée" examines the physicochemical and microbiological degradation of surface water across a tropical watershed in the Kindia region of Guinea. By focusing on two agricultural localities, Friguiagbé Gare and Fosekha, the study evaluates how diffuse pollution from agricultural practices and chemical inputs affects vital water resources.

Through an experimental setup of seven sampling stations strategically positioned along upstream-midstream-downstream longitudinal gradients (and including a pristine control site), the authors demonstrate a severe and progressive downstream decline in water quality. This degradation is characterized by marked increases in suspended solids, turbidity, chemical oxygen demand (COD), and nutrient levels such as nitrates and sulfates.

Crucially, the study highlights a critical sanitary risk, with bacterial indicators like total coliforms, fecal coliforms, and total microbial flora peaking significantly in downstream zones. Principal Component Analysis (PCA) successfully synthesizes these findings, revealing a primary environmental gradient (explaining 48.7% of the variance) dominated by nitrates, suspended solids, turbidity, nitrites, and COD, which maps the cumulative impact of upstream agricultural runoff and human activity.

The paper addresses a vital environmental and public health issue in West Africa, where rural populations rely heavily on untreated surface waters. The research design, combining classical spatial limnology with multivariate statistical analyses, is conceptually sound and provides clear, evidence-based insights into watershed dynamics. However, several critical inconsistencies in data presentation, typographical errors,

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and a severe structural contradiction regarding microbiological values must be resolved before this manuscript can be considered suitable for publication and indexing.

Detailed Discussion on the Suggestions for the Improvement of the Article

1. Resolving the Severe Numeric Contradiction in Microbiological Data

The most critical issue in this manuscript is a massive numerical discrepancy between the text and the tables regarding the microbiological indicators. In the "Variability microbiological" text section (lines 167–170), the author states that Friguiagbé Gare exhibits total coliform levels of 37,600 UFC/100 mL and fecal coliform levels of 23,600 UFC/100 mL, while Fosekha has lower but still high levels (22,600 and 14,200 UFC/100 mL, respectively).

However, in the subsequent text (lines 177–181) and Figure 2, the author states that total coliforms peak at only 85 UFC/100 mL and fecal coliforms at 75 UFC/100 mL at Friguiagbé downstream. This is further contradicted in the Discussion (line 272), which suddenly reports downstream total coliforms at 67,500 UFC/100 mL.

This represents an order of magnitude difference of up to 1,000-fold. This confusion likely stems from a mixing of local values at individual stations with regional averages, or a typographical mismatch between decimal commas and thousands separators (e.g., confusing "23.600" as twenty-three point six vs. twenty-three thousand six hundred). It is absolutely paramount that the author conducts a comprehensive audit of all microbiological datasets, aligning the abstract, the results text, Table 4, Figure 2, and the discussion to present a single, mathematically cohesive set of values.

2. Correcting Typographical Errors and Missing Parameters in Tables

The presentation of data in the tables suffers from several clear omissions and formatting oversights. In Table 1, under the "Analyse de variance appliquée aux nutriments indicateurs d'eutrophisation," the Fisher value (\$F\$) and the significance value (\$P > F\$) for "Nitrite (mg/l)" are completely blank.

Similarly, in Table 2, the \$P > F\$ value for "Nitrite (mg/l)" is omitted entirely. Even if the analysis of variance showed that nitrite differences were not statistically significant—as stated in the text (line 122)—the actual calculated \$F\$ and \$P\$-values must still be reported in the tables to maintain scientific transparency.

Additionally, Table 3 contains a column header with the spelling "Nikel," which must be corrected to "Nickel". Under the "Significatif" row in Table 3, the value for the first column is written as "Oui" instead of "Non". Finally, the units in the column header for Chrome, Cadmium, and Plomb are specified as "(mg/Kg MS)", yet the values reported in the rows below (e.g., Cadmium at 0.005–0.010 mg/kg; Lead/Plomb at 0.200–0.700 mg/kg) are highly unusual for raw sediment dry weight without further

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qualification, or may represent water-phase concentrations with incorrect unit labels. The author must carefully verify and clarify these units.

3. Eliminating Residual Text Fragments, Draft Elements, and Overlaps

The manuscript contains several clear draft remnants and formatting errors that undermine its academic presentation. On page 4, line 104, the title "3.1 Caractérisation physico-chimique des eaux" has the word "phisation" awkwardly printed directly underneath it, which is clearly a disjointed fragment of the sub-heading "eutrophisation" on line 105.

On page 6, line 161, the isolated word "UNDER" is left floating at the bottom of the page. This is repeated on page 9, line 219, where the fragment "UND" appears, and on page 10, line 240, which features another stray "E". These fragments are likely remnants of a draft watermark (such as "UNDER REVIEW").

Additionally, the graph in Figure 1 contains a duplicated label on line 162 that reads "2 ACP Qualité de l'eau" superimposed or floating near the figure. The author must systematically clean the manuscript document to remove these stray characters, watermarks, and overlapping texts.

4. Expanding the Discussion on Herbicide and Pesticide Migration

In the introduction, the author highlights that modern agricultural intensification in tropical zones is heavily reliant on herbicides and pesticides, citing recent regional and global literature on glyphosate, metolachlore, and atrazine residues. This establishes a strong expectation that the study will trace these organic chemical inputs.

However, in the results and discussion sections, the actual chemical variables measured are restricted entirely to inorganic nutrients (nitrates, nitrites, sulfates, phosphates) and heavy metals (copper, zinc, chrome, cadmium, lead, nickel). No pesticide or herbicide residue analyses were performed.

To bridge this conceptual gap, the author must explicitly expand the Discussion section. Rather than implying a direct trace of these "invisible impacts" of chemical inputs, the discussion should clarify that the chemical inputs (primarily synthetic N-P-K fertilizers) act as primary drivers of nutrient enrichment (nitrates and phosphates) and soil mineral mobilization.

Furthermore, the author should discuss how the physical dynamics of the watershed—specifically high tropical rainfall (2,000 to 3,500 mm) driving severe soil erosion and particulate runoff—facilitate the co-transport of both the unmeasured pesticides and the measured sediment-bound metals/nutrients from agricultural parcels into the downstream aquatic ecosystems. This will provide a more realistic and scientifically accurate connection between the paper's title, its introductory literature, and its actual empirical dataset.

Recommendation to the Editor

International Journal of Advanced Research

Publisher's Name: Jana Publication and Research LLP

www.journalijar.com

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Major Revisions

Comments to the Editor

This manuscript provides highly valuable empirical data on the spatial patterns of surface water degradation within an understudied tropical watershed in Guinea. The research highlights the critical indirect impacts of agricultural land use, showing that diffuse transport mechanisms (erosion and runoff) are key pathways for both physical and microbiological degradation downstream. The integration of multivariate statistical tools (PCA) is appropriate and strengthens the spatial analysis.

However, the paper cannot be accepted in its current form due to a severe and confusing numerical contradiction regarding its core microbiological findings, where different sections of the text and figures report coliform values that differ by up to three orders of magnitude. This is accompanied by several notable omissions of statistical values in Tables 1 and 2, minor typographical and translation errors in Table 3, and several stray text fragments resulting from incomplete formatting or draft watermarks.

Furthermore, the discussion needs to better reconcile the lack of direct pesticide measurements with the paper's emphasis on chemical inputs. These issues require a major revision to ensure the scientific integrity and presentation quality of the work.