

REVIEWER'S REPORT

Manuscript No.: IJAR-53820

Date: 15-09-2025

Title: ASSESSING POLLUTION FROM TRACE METALS ELEMENTS AND ANALYSING ECOLOGICAL RISKS IN THE TAILINGS FACILITY AND SURROUNDING SOILS AT THE SABODALA MINE.

Recommendation:

Accept as it is

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: Tahir Ahmad

Reviewer's Comment for Publication.

This manuscript presents a detailed environmental assessment of **trace metal contamination and ecological risk** associated with the Sabodala gold mine tailings facility in southeastern Senegal. The **Abstract (lines 1–17)** effectively summarizes key findings, including elevated levels of arsenic (As), antimony (Sb), nickel (Ni), and cadmium (Cd) in tailings compared to surrounding soils. The introduction (lines 3–17) provides a solid context, clearly identifying the environmental and health implications of trace metal pollution and referencing relevant literature. The **Materials and Methods (lines 18–111)** section is thorough and replicable, detailing sampling strategy, pH and electrical conductivity measurement, and the analytical procedures (ICP-AES and ICP-OES), as well as the computation of contamination indices (Pollution Index, Igeo, Contamination Factor, and Ecological Risk Index). This methodological rigor enhances the reliability of the results.

The **Results and Discussion (lines 113 onward)** present a comprehensive geochemical characterization, with clear data tables and well-labeled figures depicting spatial variability in pH, EC, and trace metal concentrations. The finding that mine tailings contain significantly higher concentrations of As (up to 687.54 mg/kg) and other metals than surrounding soils is noteworthy. The ecological risk assessment highlights arsenic as the dominant contributor to potential environmental hazards, with an ecological risk index (ERI) of 406.37 for mine tailings versus 21.65 for surrounding soils. These insights are valuable for stakeholders and policymakers involved in environmental management and mine tailings rehabilitation.

Minor revisions are recommended to improve clarity and presentation. Some sentences are lengthy and would benefit from concise restructuring to improve readability. Ensure consistent formatting of references (e.g., check citations like [17], [18] for style consistency). Figures mentioned (e.g., Figures 5 and 6) should be fully included and labeled in the final manuscript. Additionally, while the methodology

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is comprehensive, it would strengthen the paper to briefly discuss potential human health implications of these contamination levels and outline specific remediation strategies for high-risk metals such as arsenic.

Overall, the study is original, methodologically sound, and provides significant insights into trace metal contamination in mining environments. With minor editorial adjustments and the inclusion of all referenced figures, the manuscript will be a strong contribution to environmental geochemistry and ecological risk assessment literature.