Goldschmidt 2026 Abstract
https://doi.org/10.46427/gold2026.33531

Geochemical Histories and Contemporary Paths of Metal Pollution in Africa

MODINAT M ADEKUNLE

Nigerian Institute of Social and Economic Research

Most parts of Africa are blessed with huge deposits of metals, which have been extracted for a long time, from past artisanal mining activities to current, more sophisticated extraction processes. The metal of interest has also metamorphosed over time, and this is not without its attendant implications for environmental and human health. Metal pollution is generally linked to the nature of the mineral-rich geology of the environment, the various kinds of extraction activities carried out over time, and other human-environment conditions that change rapidly with time. In Africa, studies on the pattern of metal pollution are fragmented, and this makes it difficult to ascertain how past metal extraction influences present and emerging threats in the region.

Using systematic review and synthesis of peer-reviewed works, this paper examines the spatial distribution, evolution, and emerging trajectories of metal pollution in the continent of Africa. It also examines patterns of metal presence in different media, identifying metal pollution hotspots within regional geological settings and major mining belts. Trends of metal pollution or contamination from the mining and smelting methods during colonial times to present-day extraction from the post-independence industrial period and urban growth will be examined. Studies obtained from credible databases will be screened using predefined inclusion and exclusion criteria based on metal types, period, method of analysis, and spatial reference.

Extracted information will be organised by region and major geological and mining belts in Africa. Pathways linking metal sources to potential human and environmental (soils, sediments, surface and groundwater) exposure will be emphasised. Major phases of metal input will be structured historically from the colonial period to the present, focusing on the persistence and remobilisation of historic contaminants. Threats will be evaluated based on past metal extraction methods and present exploitation. Findings will provide a first comprehensive, geochemically grounded synthesis of metal pollution in Africa across environmental media, historical phases, and emerging exposure pathways. Also, this work would identify priorities for future geochemical research relevant to health-orientated assessments.