African Aerial Photography and Remote Sensing (Technology/Methodology)

# Blockchain Technology in Supply Chain Transparency during Mineral Extraction in Democratic Republic of Congo and Liberia: A Scoping Review

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## Abstract

Blockchain technology has emerged as a promising solution for enhancing transparency in complex supply chains, particularly within mineral extraction sectors characterized by high levels of corruption and illicit activities. The review will be guided by a systematic search strategy encompassing academic databases such as Scopus, Web of Science, and Google Scholar using keywords related to blockchain technology, mineral extraction, supply chain transparency, and DRC/Liberia. Studies published between and will be included. Blockchain-based solutions have shown promise in reducing intermediaries' influence on the supply chain by increasing traceability and accountability, though their adoption is still nascent with varying degrees of success across different contexts. While blockchain technology holds significant potential for enhancing transparency and integrity in mineral extraction operations, its implementation faces challenges related to technological maturity, regulatory frameworks, and stakeholder engagement. Further research should focus on developing robust blockchain solutions tailored to local conditions. Policy makers should consider incentivizing the use of blockchain technology through grants or tax benefits, while fostering collaboration between industry stakeholders to address technical and operational hurdles. Academic communities can contribute by conducting more detailed case studies and comparative analyses. Model estimation used $\hat{\{\theta\}} = argmin\{\theta\} sumiell(yi, f\theta(\xi)) + \lambda lVert\theta rVert 2^2$, with performance evaluated using out-of-sample error.

**Keywords:** *African Geography, Blockchain, Supply Chain Management, Transparency, Mineral Extraction, Africa, Logistics Systems*

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