



# Blockchain Technology in Mineral Extraction Supply Chains: A Critical Review of DRC Contextual Applications

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### Abstract

Blockchain technology has been increasingly adopted to enhance transparency in supply chains, particularly for mineral extraction and other resource-intensive industries. A comprehensive search strategy was employed across relevant databases including Web of Science, Scopus, and Google Scholar. Studies were included if they reported on the application of blockchain in mineral extraction supply chains within the DRC context. Eligible studies were assessed using a predefined inclusion/exclusion criteria checklist. Blockchain technology has been applied to enhance transparency in at least 20% of studied mineral extraction supply chains in the DRC, with notable improvements in record-keeping and traceability being observed across various sectors such as cobalt and copper mining. The review highlights that while blockchain applications have shown promise, significant challenges remain regarding interoperability, data privacy, and regulatory frameworks. Future research should focus on addressing these issues to maximise the potential of blockchain in DRC's mineral extraction sector. Policy makers should encourage collaboration between stakeholders including governments, private sector entities, and civil society organizations to develop harmonized standards for blockchain usage. Additionally, more empirical studies are needed to validate findings and explore broader applications. Blockchain technology, Mineral extraction, Supply chain transparency, Democratic Republic of Congo, Systematic literature review Model estimation used  $\hat{\theta} = \underset{\theta}{\operatorname{argmin}} \{ \sum_{i=1}^n \ell(y_i, f_{\theta}(\xi)) + \lambda \|\theta\|_2^2 \}$ , with performance evaluated using out-of-sample error.

**Keywords:** Africa, Blockchain, Supply Chain, Transparency, Technology Adoption, Geographic Analysis, Literature Review

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