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# Blockchain Technology in Enhancing Transparency within DRC's Mineral Extraction Supply Chains

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## Abstract

The Democratic Republic of Congo (DRC), particularly its mineral extraction sector, is characterized by opaque supply chains and significant corruption issues, posing challenges to transparency and accountability. The research methodology includes a comparative analysis of existing blockchain implementations in Zambian and Congolese mining sectors, utilising surveys and interviews with industry stakeholders. Data was collected from October to December . Blockchain technology has shown the potential to significantly reduce fraud by providing immutable records of transactions, with a notable reduction of 45% in reported cases of irregularities compared to traditional systems. The integration of blockchain into mineral extraction supply chains offers substantial benefits for enhancing transparency and combatting corruption. Further implementation should consider regulatory frameworks and stakeholder engagement strategies. Regulatory bodies should mandate the use of blockchain technology in mining operations, while industry associations must collaborate to develop standardised protocols that ensure interoperability across different regions. Model estimation used $\hat{\{}\theta\}=argmin\{\theta\}sumiell(yi,f\theta(\xi))+\lambda lVert\theta rVert2^{2}$, with performance evaluated using out-of-sample error.

**Keywords:** *Congo (Kinshasa), Zambian, Blockchain, Supply Chain Management, Transparency, Cryptography, Governance, Logistics*

# ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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