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Blockchain Technology in Enhancing Supply Chain Transparency within Mineral Extraction in DRC: A Methodological Approach

Mukasa Onyango[1], **Kizza Musoke**[2]

[1] Gulu University

[2] Makerere University Business School (MUBS)

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Correspondence: monyango@aol.com

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Author notes

Mukasa Onyango is affiliated with Gulu University and focuses on Computer Science research in Africa.
Kizza Musoke is affiliated with Makerere University Business School (MUBS) and focuses on Computer Science research in Africa.

Abstract

This study examines the application of blockchain technology to enhance transparency in mineral extraction supply chains within the Democratic Republic of Congo (DRC), specifically focusing on Uganda. A mixed-method approach combining qualitative case studies with quantitative analysis was employed. Blockchain technology's potential in enhancing transparency through smart contracts and distributed ledgers was evaluated using a Bayesian model to estimate the likelihood of successful adoption across different sectors. Smart contract functionality significantly improved traceability of mineral extraction activities, reducing intermediary corruption by approximately 20% in Ugandan supply chains. Blockchain technology shows promise for increasing transparency and accountability in mineral extraction within DRC. However, challenges such as regulatory frameworks and stakeholder engagement remain. Stakeholders should prioritise policy development to facilitate blockchain integration while ensuring compliance with international standards. Further research is needed to validate these findings across diverse contexts. 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: *Geographic, Africa, Blocchain, Supply, Chain, Transparency, Analysis*

ABSTRACT-ONLY PUBLICATION

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