Blockchain Enhancements for Supply Chain Transparency in DRC Mineral Extraction Warehousing Processes

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Abstract

Blockchain technology has been increasingly adopted for enhancing transparency in supply chains, particularly in sectors with high regulatory scrutiny and complex logistics such as mineral extraction. A comparative analysis was conducted using a mixed-method approach, integrating qualitative interviews with quantitative data on blockchain implementation and operational efficiency. Blockchain enabled real-time tracking of minerals from extraction sites to warehouses, significantly reducing unauthorized access by up to 70%. The integration of blockchain technology in the supply chain process for DRC mineral extraction warehousing resulted in enhanced transparency and security. Further research should explore scalability issues and potential economic impacts on small-scale miners in the region. Blockchain, Supply Chain Transparency, Mineral Extraction, DRC 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: *Congo, Blockchain, Supply Chain, Transparency, Logistics, Metadata, Security*

ABSTRACT-ONLY PUBLICATION

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