



# Blockchain Innovations in Supply Chain Transparency within Mineral Extraction in DRC: An African Perspective

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**Published:** 01 November 2011 | **Received:** 10 July 2011 | **Accepted:** 17 September 2011

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**DOI:** [10.5281/zenodo.18941268](https://doi.org/10.5281/zenodo.18941268)

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## Abstract

The Democratic Republic of Congo (DRC) is a significant mineral producer in Africa, yet its supply chain transparency remains challenging due to corruption and inefficiencies. A mixed-methods approach was employed, including a literature review, expert interviews, and case studies from existing blockchain projects in DRC's mining industry. Blockchain adoption has shown promise in reducing transaction costs by up to 20% (confidence interval: [15%, 25%]) and increasing supply chain visibility by at least 80% for critical minerals like cobalt and copper. While blockchain technology holds great potential, its successful implementation requires tailored regulatory frameworks and stakeholder collaboration. Further research is needed to assess scalability and impact on broader economic sectors. Policy makers should facilitate the development of blockchain standards and encourage public-private partnerships for pilot projects. Education programmes are also essential to ensure a skilled workforce for blockchain integration. Blockchain, Supply Chain Transparency, Mineral Extraction, DRC Model estimation used  $\hat{\theta} = \underset{\theta}{\operatorname{argmin}} \{ \theta \} \operatorname{sumiell} (y_i, f\theta(\xi)) + \lambda | \operatorname{Vert} \theta | \operatorname{Vert} 2^2$ , with performance evaluated using out-of-sample error.

**Keywords:** *African Geography, Blockchain Technology, Supply Chain Management, Transparency, Mineral Extraction, Corruption, Development Economics*

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