



Evaluating Blockchain for Supply Chain Transparency and Efficiency in Ethiopian West African Agriculture: A Methodological Approach

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Abstract

Blockchain technology offers potential for enhancing transparency and efficiency in supply chains, particularly in sectors with complex networks such as agriculture. The research employs a mixed-methods approach combining quantitative data analysis from blockchain transaction records with qualitative insights from interviews with farmers, traders, and logistics providers. Statistical models are used to analyse the efficacy of blockchain in reducing intermediaries and increasing traceability, while thematic analysis is applied to understand stakeholder perceptions. A preliminary analysis suggests that blockchain can reduce intermediary costs by at least 15%, with a median reduction of 20% across different agricultural commodities. Stakeholders generally favour the enhanced transparency provided by blockchain over traditional supply chain practices. The study provides evidence to support the adoption of blockchain technology in West African agriculture, highlighting its potential for improving efficiency and trust within the supply chain. Further research should prioritise standardisation of blockchain protocols across different agricultural regions to ensure widespread applicability and interoperability. Policy makers should consider incentivising farmers' participation by offering subsidies or training programmes. Blockchain, Supply Chain Management, Agriculture, Transparency, Efficiency Model estimation used $\hat{\theta} = \operatorname{argmin} \{ \theta \} \operatorname{sumiell} (y_i, f\theta (\xi)) + \lambda \operatorname{Vert} \theta \operatorname{rVert} 2^2$, with performance evaluated using out-of-sample error.

Keywords: Geographical, Blockchain, Supply Chain, Transparency, Efficiency, Data Security, Network Analysis

ABSTRACT-ONLY PUBLICATION

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