African Mining Law and Policy (Law/Mining/Policy crossover)

Hydropower Ecosystems in Tanzania: Comparative Analysis of Potential and Environmental Sustainability in the Congo Basin

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Abstract

The Congo Basin in Tanzania is a significant source of hydropower potential due to its diverse hydrological systems and abundant water resources. The research employs a mixed-methods approach, combining qualitative assessments with quantitative data analysis to evaluate potential impacts and sustainability indicators. A notable theme emerged regarding the significant water flow variations (up to 70% seasonal fluctuation) in river systems, posing challenges for consistent hydropower generation and environmental management across different sites within the basin. The study concludes that while Tanzania's hydropower sector shows promise, there is a need for more comprehensive regulatory frameworks and adaptive management strategies to ensure both economic benefits and ecological integrity. Policy recommendations include enhancing stakeholder engagement in decision-making processes, implementing water resource management plans tailored to site-specific conditions, and promoting research-based evidence to inform future hydropower development projects. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Congo Basin, Hydropower, Ecosystem Services, Environmental Impact Assessment, Renewable Energy Deployment, Sustainable Development Goals, Water Resource Management*

ABSTRACT-ONLY PUBLICATION

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