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Geothermal Energy Development in the East African Rift Valley: Zambia's Potential and Challenges

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Abstract

The East African Rift Valley is a geological feature that offers potential for geothermal energy development due to its high tectonic activity and associated hydrothermal systems. The analysis is based on existing geological surveys, economic models, and interviews with stakeholders involved in renewable energy development. Zambia should consider a phased approach to geothermal exploration and development, leveraging international partnerships for technology transfer and financial support. Stakeholders must prioritise policy frameworks that address land use rights, environmental sustainability, and equitable energy access. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *East African Rift Valley, Geothermal Energy, Tectonics, Hydrothermal Systems, Renewable Resources, Basin Analysis, Seismic Activity*

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