



Methodological Evaluation of Regional Monitoring Networks in Rwanda Using a Difference-in-Differences Approach to Assess System Reliability

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Abstract

Rwanda has established regional monitoring networks to assess environmental impacts of agricultural practices across its diverse landscapes. A difference-in-differences (DiD) econometric model was employed to analyse trends in forest cover changes over time across monitored regions. Uncertainty is quantified through robust standard errors. The DiD approach revealed significant differences in forest cover changes between regions, suggesting systematic biases in monitoring data due to varying climate conditions and sampling frequencies. Regional monitoring networks in Rwanda show reliability issues primarily related to climate variability, necessitating improved data collection protocols for future assessments. Enhanced coordination among stakeholders is recommended to ensure consistent climate data inputs into the DiD model for more accurate trend analyses. Rwanda, Monitoring Networks, Difference-in-Differences, Climate Variability, Forest Health The empirical specification follows $Y = \beta_{0+\beta} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: Rwanda, Geospatial Analysis, Monitoring Networks, Difference-In-Differences, Econometrics, Agricultural Practices, System Reliability

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