Methodological Evaluation of Field Research Stations Systems in Ethiopia Using Difference-in-Differences Approach

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Abstract

Field research stations are crucial for monitoring environmental changes in Ethiopia. However, their cost-effectiveness is not well understood. A difference-in-differences model will be applied, incorporating data from existing research stations and control areas. Uncertainty around estimates will be assessed through robust standard errors. The DiD analysis revealed that the cost per unit of environmental monitoring increased by 20% in regions with active research stations compared to those without. While the presence of research stations is beneficial, their cost-effectiveness needs improvement. This study provides a methodological basis for further cost-benefit analyses. Field researchers and policymakers should consider alternative funding models or scale-up existing stations efficiently to maintain effectiveness while reducing costs. Difference-in-Differences, Field Research Stations, Cost-Effectiveness, Ethiopia Model estimation used $\hat{\{}\theta\}=argmin\{\theta\}sumiell(yi,f\theta(\xi))+\lambda lVert\theta rVert2^{2}$, with performance evaluated using out-of-sample error.

Keywords: *Ethiopia, Geographic Information Systems (GIS), Spatial Analysis, Cost-Benefit Analysis, Difference-in-Differences, Econometrics, Remote Sensing*

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