Bayesian Hierarchical Model for Measuring Adoption Rates in Smallholder Farms Systems of Ethiopia: A Methodological Evaluation

Negusse GebreMariam[1]**, Misgana Mekonnen**[2,3]**, Mamo Abeba**[2,3]**, Berhanu Desta**[1]

[1] Ethiopian Public Health Institute (EPHI)

[2] Ethiopian Institute of Agricultural Research (EIAR)

[3] Adama Science and Technology University (ASTU)

Correspondence: ngebremariam@aol.com

Author notes

Negusse GebreMariam is affiliated with Ethiopian Public Health Institute (EPHI) and focuses on Agriculture research in Africa.
Misgana Mekonnen is affiliated with Ethiopian Institute of Agricultural Research (EIAR) and focuses on Agriculture research in Africa.
Mamo Abeba is affiliated with Ethiopian Institute of Agricultural Research (EIAR) and focuses on Agriculture research in Africa.
Berhanu Desta is affiliated with Ethiopian Public Health Institute (EPHI) and focuses on Agriculture research in Africa.

Abstract

The adoption rates of new agricultural technologies among smallholder farmers in Ethiopia are essential for improving productivity and sustainability. A Bayesian hierarchical logistic regression model was employed to analyse data from multiple farms. The model accounts for spatial heterogeneity and potential confounding variables such as farmer education levels and access to credit. The analysis revealed significant variations in adoption rates across different regions, with a median adoption rate of 45% overall. The Bayesian hierarchical model provided robust estimates of adoption rates, accounting for spatial and socio-economic influences effectively. Future studies should incorporate additional data sources to enhance the model's predictive power and reliability. Bayesian Hierarchical Model, Adoption Rates, Smallholder Farms, Ethiopia, Logistic Regression The empirical specification follows $Y = \vec{\beta}_{0+\beta} \, p \, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

✉ REQUEST FULL PAPER

Email: info@parj.africa

Request your copy of the full paper today!

SUBMIT YOUR RESEARCH

Are you a researcher in Africa? We welcome your submissions!

Join our community of African scholars and share your groundbreaking work.

Submit at: app.parj.africa

Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global Knowledge