Bayesian Hierarchical Model for Measuring Adoption Rates in Senegalese Smallholder Farm Systems

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Abstract

This study aims to evaluate smallholder farm systems in Senegal through a Bayesian hierarchical model, focusing on measuring adoption rates. A Bayesian hierarchical model was employed, incorporating prior knowledge on adoption dynamics and data from multiple sources in Senegal's diverse farm systems. Data were collected through surveys and secondary sources to estimate parameters of the model accurately. The model revealed significant regional variations in adoption rates, with a notable trend towards higher adoption in northern regions compared to southern areas. This study provides robust estimates for adoption rates using Bayesian methods, contributing valuable insights into agricultural innovation diffusion across Senegal. Further research should focus on validating these findings through longitudinal studies and exploring socioeconomic factors influencing adoption patterns. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

ABSTRACT-ONLY PUBLICATION

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