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Bayesian Hierarchical Model Assessment of Adoption Rates in Manufacturing Plants within Senegal's Agricultural Sector

Ibrahima Sarr[1], **Muhammadou Diop**[2], **Issa Ndiaye**[2,3], **Fatoumata Mbengue**[3]

[1] Department of Crop Sciences, Institut Sénégalais de Recherches Agricoles (ISRA)

[2] Department of Agricultural Economics, Cheikh Anta Diop University (UCAD), Dakar

[3] African Institute for Mathematical Sciences (AIMS) Senegal

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Correspondence: isarr@hotmail.com

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Author notes

Ibrahima Sarr is affiliated with Department of Crop Sciences, Institut Sénégalais de Recherches Agricoles (ISRA) and focuses on Agriculture research in Africa.

Muhammadou Diop is affiliated with Department of Agricultural Economics, Cheikh Anta Diop University (UCAD), Dakar and focuses on Agriculture research in Africa.

Issa Ndiaye is affiliated with African Institute for Mathematical Sciences (AIMS) Senegal and focuses on Agriculture research in Africa.

Fatoumata Mbengue is affiliated with African Institute for Mathematical Sciences (AIMS) Senegal and focuses on Agriculture research in Africa.

Abstract

Manufacturing plants within Senegal's agricultural sector are increasingly adopting advanced technologies to enhance productivity and efficiency. A Bayesian hierarchical model was employed to assess adoption rates across different regions and types of manufacturing plants. The model accounts for variability within and between regions. The analysis revealed that adoption rates varied significantly by region, with a notable proportion (35%) higher in the northern part compared to the southern region. The Bayesian hierarchical model provided robust estimates of adoption rates, allowing for nuanced understanding of regional variations within Senegal’s agricultural sector. Further research should consider long-term impacts and potential policy recommendations based on these findings. Bayesian Hierarchical Model, Adoption Rates, Manufacturing Plants, Agriculture Sector, Senegal The empirical specification follows $Y = \vec{\beta_{0+\beta}} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African agriculture, Bayesian statistics, hierarchical modelling, adoption rates, manufacturing systems, productivity enhancement, Senegal*

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