



Multilevel Regression Analysis for Measuring Adoption Rates of Industrial Machinery Fleets in Ethiopian Context

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Abstract

Industrial machinery fleets play a pivotal role in post-harvest processing in Ethiopia, yet their adoption rates and factors influencing uptake are not well understood. A multilevel logistic regression model was employed to analyse data collected from a stratified random sample of farms ($N = 250$) across three major agricultural regions \in Ethiopia. The model accounts for both farm-level and region-level effects on the probability of machinery adoption. The analysis revealed that farmers with higher levels of education were significantly more likely to adopt industrial machinery, compared to those with lower education levels (OR = 2.5, CI: 1.3-4.8). This study provides empirical evidence on the factors influencing adoption rates and highlights regional disparities in machinery utilization. Policy makers should prioritise capacity building programmes for farmers, particularly in less educated regions to enhance machinery adoption. multilevel regression analysis, industrial machinery, post-harvest processing, Ethiopia

Keywords: Ethiopia, Multilevel Regression, Logistic Regression, Hierarchical Analysis, Adoption Factors, Industrial Machinery, Fleet Management

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