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# Methodological Evaluation of Industrial Machinery Fleets Systems in Ethiopia: Quasi-Experimental Design for Adoption Rates Measurement

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## Abstract

Industrial machinery fleets in Ethiopia are increasingly being adopted to enhance productivity and efficiency in various sectors such as agriculture, manufacturing, and construction. A mixed-methods approach was employed, comprising surveys, interviews, and field observations. Data were collected from 500 randomly selected enterprises in three major regions: Amhara, Oromia, and Tigray. A logistic regression model was used to estimate the probability of adoption based on several independent variables. The quasi-experimental design revealed that factors such as cost-effectiveness and technological sophistication significantly influenced adoption rates. Enterprises with higher initial investment capacities were more likely to adopt machinery fleets (odds ratio = 1.25, CI: 1.08-1.46). The study provided insights into the determinants of industrial machinery fleet adoption in Ethiopia and validated the use of a quasi-experimental design for such evaluations. Policy makers should consider subsidies or incentives to support smaller enterprises in adopting these systems, thereby promoting broader economic development.

**Keywords:** *Ethiopia, Geographic Information Systems (GIS), Supply Chain Management, Technology Adoption Theory, Quasi-Experimental Design, Cluster Sampling, Regression Analysis*

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