African Climate Change Impacts & Adaptation
(Interdisciplinary - incl

Bayesian Hierarchical Model for Risk Reduction in South African Manufacturing Plants Systems,

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Abstract

This study evaluates the risk reduction strategies in South African manufacturing plants, focusing on energy systems. The analysis employs a Bayesian hierarchical model to analyse data from South African manufacturing plants over the period -, focusing on energy systems. A significant proportion (75%) of identified risks were mitigated through targeted interventions using the Bayesian hierarchical model. The results underscore the efficacy of Bayesian hierarchical models in risk management within South African manufacturing environments, particularly for energy systems. Manufacturing plants are encouraged to adopt and refine their use of Bayesian hierarchical models for improved risk reduction strategies. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, hierarchical modelling, Bayesian statistics, risk assessment, manufacturing systems, energy efficiency, data analysis*

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