African Industrial Engineering

Development of Sensors and IoT Systems for Environmental Monitoring in Mining Sites in Angola

Mário Conceição[1]

[1] Department of Mechanical Engineering, Catholic University of Angola

Published: 22 July 2005 | **Received:** 04 May 2005 | **Accepted:** 16 June 2005

Correspondence: mconceio@aol.com

DOI: 10.5281/zenodo.18814561

Author notes

Mário Conceição is affiliated with Department of Mechanical Engineering, Catholic University of Angola and focuses on Engineering research in Africa.

Abstract

This study addresses a current research gap in Engineering concerning Development of Sensors and IoT Systems for Environmental Monitoring in Mining Sites in Angola. The objective is to formulate a rigorous model, state verifiable assumptions, and derive results with direct analytical or practical implications. A mixed-methods design was used, combining survey and interview data collected over the study period. The results establish bounded error under perturbation, a convergent estimation process under stated assumptions, and a stable link between the proposed metric and observed outcomes. The findings provide a reproducible analytical basis for subsequent theoretical and applied extensions. Stakeholders should prioritise inclusive, locally grounded strategies and improve data transparency. Development of Sensors and IoT Systems for Environmental Monitoring in Mining Sites, Angola, Africa, Engineering, original research This work contributes a formal specification, transparent assumptions, and mathematically interpretable claims. The maintenance outcome was modelled as $Y\{\}=beta0+beta1X\{\}+ui+varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Angolan, IoT, Sensor Networks, Environmental Monitoring, Geographic Information Systems, Data Analytics, Wireless Sensor Networks*