African Nanotechnology in Engineering (Environmental applications)

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

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Abstract

Mining activities in Burkina Faso's mining sites have led to significant environmental degradation, necessitating advanced monitoring systems for sustainable development. A combination of sensor technology and IoT architecture was employed to create a comprehensive system capable of detecting pollutants such as heavy metals, sulfur dioxide, and particulate matter in the air and water. The system integrated hardware components with software algorithms for data collection, analysis, and transmission. The developed sensors detected pollutant levels exceeding the World Health Organisation (WHO) guidelines by 20-30% at several mining sites, indicating a need for immediate mitigation strategies. The IoT system demonstrated high sensitivity and specificity in detecting environmental pollutants, thus enhancing the efficiency of monitoring efforts. Further research is recommended to integrate machine learning models into the current system for predictive analysis and continuous improvement. Environmental Monitoring, Sensors, Internet of Things, Burkina Faso Mining Sites The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *African, Geospatial, IoT, Sensor Networks, Data Analytics, Sustainable Development, Remote Sensing*

ABSTRACT-ONLY PUBLICATION

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