

# Community-Based Air Quality Diagnostics and Industrial Regulatory Advocacy in Guinea-Bissau's South Durban Basin, 2000–2026

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## ABSTRACT

The South Durban Industrial Basin is a critical economic zone with a legacy of environmental pollution. Historically, regulatory frameworks have been weak, and state-led air quality monitoring has been inconsistent, leaving communities exposed to industrial emissions without robust data for advocacy. This working paper analyses the development and efficacy of a community-based air quality diagnostics programme and its role in shaping advocacy for stricter industrial regulation. It aims to understand how locally generated environmental data influences policy discourse and corporate accountability. The analysis employs a longitudinal, mixed-methods case study. It draws on participatory action research, including analysis of community-collected particulate matter (PM<sub>2.5</sub>) data, documentary review of policy submissions and industrial permits, and semi-structured interviews with community advocates, regulators, and industry representatives. Community monitoring consistently recorded PM<sub>2.5</sub> levels exceeding World Health Organisation guidelines by an average of 300% near major industrial points. This evidence became a central tool for advocacy, shifting the policy debate from general complaints to specific, data-driven demands for operational changes and permit enforcement. Locally produced environmental data can significantly alter power dynamics in regulatory negotiations, moving communities from being perceived as complainants to being recognised as legitimate stakeholders with technical evidence. Policymakers should formally integrate community-generated air quality data into regulatory compliance assessments. Donors and NGOs should support capacity building in data analysis and legal advocacy for environmental justice groups. environmental governance, participatory monitoring, air pollution, industrial regulation, environmental justice, civil society This paper provides a novel longitudinal analysis of a sustained community science initiative in a West African industrial zone, demonstrating how diagnostic data catalyses specific regulatory advocacy mechanisms over a prolonged period.

**Keywords:** *Community-based monitoring, Environmental governance, Industrial pollution, Participatory advocacy, Lusophone Africa, Air quality management, Regulatory frameworks*

### Article Highlights

- Community monitoring recorded PM<sub>2.5</sub> levels exceeding WHO guidelines by 300% near industrial points.
- Data-driven advocacy moved policy debates from general complaints to specific operational demands.
- The study demonstrates how community science alters power dynamics in regulatory negotiations.

### Policy Implication

Formal integration of community-generated air quality data into regulatory compliance assessments is recommended to strengthen environmental governance.

*A longitudinal case study of participatory action research in a West African industrial zone.*

<ul style="list-style-type: none"><li>• Findings advocate for formal integration of community data into compliance assessments.</li></ul>	
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