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Beyond Data: Leveraging LowCost Sensors for Policy Impact and Regulatory Acceptance

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Low-cost sensors are revolutionizing air quality monitoring, especially in under-resourced regions like Kenya. These devices enable affordable, localized data collection, which allows communities to identify pollution hotspots, raise awareness, and advocate for action. However, their integration into formal regulatory frameworks remains limited due to concerns over data reliability and perceived shortcomings compared to traditional systems (Lewis et al., 2016).

Many African cities face mounting air pollution challenges but lack consistent urban air quality monitoring. Although Kenya enacted Air Quality Regulations in 2014, data on particulate pollutants in Nairobi remains scarce. This gap is common across many African nations, hindering efforts to assess pollution impacts, inform policy, and respond effectively to deteriorating air quality. The global Air Quality Community of Practice (CoP) of the Citizen Science Global Partnership (CSGP) actively addresses these challenges by working to scale up air quality monitoring in under-resourced regions and demonstrating evidence-based policymaking through citizen science.

This presentation proposes actionable strategies to enhance the credibility and impact of low-cost sensors in policymaking and regulatory contexts in such regions. First, establishing universal calibration and validation protocols in collaboration with academic and industry stakeholders can significantly bolster the credibility of sensor data by ensuring alignment with regulatory standards (Crilley et al., 2018). The Air Quality CoP is collaborating with the WorldFAIR+ Project and the CitiObs project to create interoperability frameworks based on FAIR principles for citizen science air quality monitoring. Second, creating effective data communication strategies can maximize the visibility and impact of sensor-derived insights. Platforms that transform complex datasets into accessible visualizations and narratives can engage policymakers and the public, fostering broader support (Kumar et al., 2022).

Integrating citizen science into policy through multi-stakeholder collaborations institutionalizes community-driven data collection. Open-access platforms, such as OpenAQ, bridge local monitoring efforts with policy-level interventions, building stakeholder trust and cooperation. Finally, advocating for adaptive regulatory systems that position low-cost sensors as complementary tools to traditional monitoring methods and not replacements can drive innovation and amplify impact.

Drawing from case studies within the CoP and successful implementations, this session explores how these solutions can bridge the gap between citizen-driven data and institutional action. By tackling technical, communication, and policy challenges, low-cost sensors can be repositioned as essential tools for community agencies, filling data gaps, raising awareness, and impactful policy change.

References:

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