

AI monitors help Uganda tackle air pollution crisis

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Kampala Capital City Authority staff installing low cost air quality sensors near a school in Kampala city on 16 January. The monitoring system is helping target interventions to reduce emissions. Credit: Kampala Capital City Authority

Air quality monitors powered by artificial intelligence (AI) are being deployed in Uganda's capital city in efforts to drive down pollution-related illnesses, especially among vulnerable populations.

Kampala currently ranks among Africa's most polluted cities, according to the IQAir index, with average levels of particulate matter almost eight times higher than those recommended by the World Health Organization (WHO).

There were more than 7,250 air pollution-related deaths in the city over the last four years, [researchers estimate](#).

The mounting problem, fueled by rapid urban growth and rising numbers of vehicle users, prompted Ugandan authorities to install more than 65 sensors, each costing US\$150, throughout Kampala.

Officials say they can now identify pollution hotspots and respond quickly to areas where air quality reaches dangerous levels.

Alex Ndyabakira, head of air quality monitoring at Kampala Capital City Authority (KCCA), told SciDev.Net that the technology, put into action for the first time this month, uses an AI Air Quality Index with color-coding to identify the most polluted areas easily.

"Unfortunately, 5 million people are at risk," Ndyabakira said.

"But with [real-time data](#), we now make immediate decisions after seeing which areas have poor quality air."

The system, according to Ndyabakira, has already triggered several targeted interventions, including traffic management policies and public health initiatives.

"We have advocated for the use of a train in the Eastern route, which was highly polluted during the morning and evening, to reduce the emissions from cars on that route," said Ndyabakira.

In other efforts to clean up its act, the city has also implemented laws prohibiting smoking in public places and is encouraging the use of renewable energy, especially for cooking.

Pollution-related diseases

Air pollution is a major cause of non-communicable diseases (NCDs), contributing up to a [third of deaths in Uganda](#), according to the WHO.

"This is why we are exploring all possible measures to address this [public health threat](#) ... acting now with informed data," Frank Mugabe, NCDs officer at Uganda's Ministry of Health, told SciDev.Net.

He said there had been a significant number of hospital admissions for NCDs in the past year, including cases of diabetes, asthma in children, and heart conditions.

The Ministry of Health allocates 17% of its annual budget to NCDs and 60% of this is spent on prevention, said Mugabe.

Jane Ruth Aceng, Uganda's health minister, says fighting any disease requires real-time data and that the new air-monitoring technology will simplify processes.

"We need to know...what the burden is to advocate more effective actions," Aceng said.

Regional crisis

The [2024 air pollution index](#) of selected cities in Africa highlighted Egypt, Ghana and Nigeria as the most polluted countries in Africa, reflecting a growing crisis across the continent.

Sumi Mehta, vice president of climate and [environmental health](#) at Vital Strategies, an international non-profit that works with governments to improve health policies, says 90% of people in Sub-Saharan Africa breathe unhealthy air.

"They are at risk of heart diseases, asthma, cancers, chronic obstructive pulmonary diseases," she said, adding that the most polluting sectors in Africa are household energy, transport, solid waste and land use.

She said making data available helps policymakers make the right decisions on public health.

Until recently, limited data on air quality in Sub-Saharan Africa, meant that clean air had not been prioritized as a public health concern, says Mehta.

"This is a major and emerging public health challenge, but with [technological advancement](#) and innovation, [air quality](#) monitoring is no longer expensive and cumbersome," she added.

She said Kampala's approach to tackling air pollution replicates initiatives in other cities like Jakarta in Indonesia, Fortaleza in Brazil, and Bucharest in Romania, which are investing in clean air for both health and climate benefits.

Provided by SciDev.Net

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