

TITLE: Monitoring air quality in Sub-Saharan Africa: A case study in Libreville and Franceville in Gabon.

AUTHOR(S): Sigride Jenniska Asseko

PRESENTER(S): Sigride Jenniska Asseko

STUDENT SUBMISSION: Yes

TOPIC/TARGET AUDIENCE: Researchers

ABSTRACT: Background: Urban air pollution is a worsening public health problem in sub-Saharan Africa (SSA). Each year, an estimated 712,000 people die prematurely from poor air quality on the continent. Despite health concerns, there is a severe lack of air quality monitoring data.

Purpose: To evaluate the feasibility of using low cost sensors to compare pollution levels, during the rainy and the dry season, to better inform policies that will protect both the environment and public health in Gabon.

Methods: In 2016, I used the Dyllos DC1700 low-cost portable air quality monitors to assess seasonal variations in air quality in Libreville and Franceville in Gabon. I placed two monitors in each city to continuously measure background air pollution between July and December.

Results: Average PM_{2.5} level in Franceville was 25 µg/m³ compared to 15 µg/m³ in Libreville. Pollution levels exceeded the WHO standards, especially during the dry season (mean PM_{2.5}=40 µg/m³). Statistically significant ($p < 0.01$) differences in PM_{2.5} levels were observed between cities and seasons.

Conclusions: Low-cost air pollution monitors identified important spatial and season differences in PM_{2.5} concentrations in Gabon. These monitors can start to fill the monitoring gap in SSA and help motivate further air pollution research and policy.

OBJECTIVE(S): To assess spatial and seasonal differences in PM_{2.5} concentrations in Gabon.

To compare PM_{2.5} concentrations in Gabon to World Health Organization standards
