

Prof. Egide Kalisa, Assistant Professor at the University of Western Ontario in Canada unveiled earlier this week, a breakthrough in the new way to mitigate environmental health hazards arising from transport-related air pollution at major schools in Rwanda.

The Rwandan-born scientist discovered that transport is responsible for more than two-fold increase in the concentrations of air pollutants during drop-off hours compared to off-peak hours, indicating the dominant contribution of vehicles queuing on the school premises in Rwanda.

Yet school siting policies to protect children from air pollution have been established in some countries, some experts believe that such policies are non-existent in Africa where air pollution problem is growing and gravely under-studied due to the lack of funding to install reliable ground-level monitoring networks and lack of air quality standards.



*Children request their parents to turn their vehicle engine off if they are going to wait more than 10 seconds (Courtesy photo)*

As a follow-up, Prof Kalisa launched an educational campaign that involves discussing the science behind air pollution with schoolchildren, launching anti-idling campaigns with children at schools, and creating an Air Quality flag program that uses low-cost sensors and brightly coloured flags (Air Quality Index) to notify people and school communities about outdoor and indoor air quality.

Prof. Kalisa has been studying the composition of Black Carbon (BC) and its related sources including fossil fuels and biomass burning where fine particles were measured simultaneously indoors and outdoors at schools over a 12-month period in Rwanda.

Now, Prof. Kalisa is working with a number of schools in Kigali city to train students on how to monitor air pollution, launch anti-idling campaigns and raise air quality flags based on the status of air pollution at schools.

During the implementation phase, the new campaign dubbed “Humeka Neza” (Breathe Easy), the Rwandan-born researcher is engaging children to share their understanding of air pollution through art by drawing posters with messages to protect air pollution mitigations and how they can become agents of change.



*Children pledge to be agents of change for air pollution control (Courtesy photo)*

In his experiments, Prof. Kalisa's campaign targeted two schools in Kigali (Kigali Parents School and Dove International Montessori School) where children were trained on air pollution and how to monitor air pollution.

At the end of the campaign, children wrote notes/letters to their parents asking parents to be part of air pollution control at schools and suggesting mitigation measures such as stopping idling, using electric vehicles and requesting them to buy sensors to use themselves to monitor air pollution at home.

Prof Kalisa also provided hands-on workshops to children, and allowing children to use air quality sensors and monitors, measuring and analyzing data independently, is a great way to get hands-on experience with scientific tools and STEM (science-technology-engineering-math) education.

This experiment, according to him will provide children access to personalized data and increase their awareness of air pollution and their desire to reduce air pollution exposure, especially during cooking time.

Presently Prof. Kalisa, as a doctoral degree holder in Health and Environmental Science assisted some schools during the pilot phase to install air pollution monitors for assessing the variation of air pollution at school, used air purifiers in classrooms, planted trees (one tree per child) and recommended the best time to allow children to play outdoors during low air pollution peak and how to choose less polluted routes to schools.

Latest estimates by the World Health Organization (WHO) show that Air pollution causes more than 50 percent of acute lower respiratory infections in children under five years of age in low- and middle-income countries. It can lead to asthma, childhood cancers, chronic diseases, poor lung function, pneumonia, and other types of acute lower respiratory infection.

According to the UN agency, new research has shown that Air pollution affects children's learning process by exacerbating respiratory illnesses, fatigue, school absenteeism, and attention problems.

In his latest peer-reviewed article, Prof. Kalisa has demonstrated that Air pollution

exposure is a particular concern in African countries such as Rwanda, which has a high density of ageing diesel vehicles (high emission rates), dusty roads, and cooking emissions from open fires and stoves fueled by kerosene and biomass.

In addition to adverse health outcomes, high levels of exposure to air pollution in schoolchildren have also been associated with poor academic performance, it said.

Prof. Kalisa is now trying to address some challenges associated with air pollution at schools in Rwanda where schoolchildren spend up to 8 hours of their day in classrooms at schools, often located in high-density urban areas.

“A significant portion of children’s exposure to traffic-related pollution occurs in and around schools, and in transit to these locations,” he said.

Prof. Kalisa recently received the Most Outstanding Research Contribution to Addressing the National Societal Challenge from the National Council for Science and Technology (NCST).

He has considerable experience working with multidisciplinary and international research teams, and his commitment to a scientific career has driven him to lead the nascent field of air quality research in sub-Saharan Africa.

This project focusing on children exposure to ambient air pollution at school in Rwanda and in Canada is part of his research group “HEALTH” (Human, Environment, Location, Transport and Health).

One of the major focuses is to examine the intersections between transportation, health, and urbanization and uses low-cost sensors and citizen science to improve local and regional air quality policy measures.