

Detailed view on sessions related to African air quality and atmospheric science

Monday

Exploring a just energy transition in Africa through the lens of the climate, health, air quality nexus

Date & Time: Monday 20 June 15:00-16:30 SAST (UTC+2)

Session type: Dialogue

Venue: Hybrid

In Person: Conference Room 2

Online: <https://attend.sri2022.org/meetings/virtual/hSKkZYKFgN7C9zgghu>

Conveners: Langley Dewitt, Director, Rebecca Garland, Cathy Leal-Liousse, Andriannah Mbandi, Pallavi Pant, N'datchoh Evelyne Touré

Nearly 759 million people worldwide lack access to electricity and ~1/3rd of the global population (~2.6 billion people) lack access to clean cooking fuels. A majority of people without access to clean energy reside in the Global South. As countries plan their energy futures, taking into account both economic and societal development, as well as the impacts on our environment, there are a variety of considerations, including air quality, climate action, human and ecosystem health, and gender equity.

Both climate and air quality impacts are largest in the Global South, and increasingly become mainstream issues across Africa. Countries in the region often need to scale up energy production and availability as they develop, but are often resource-limited. Ensuring that the impending energy transitions, as well as the resulting energy systems themselves, are efficient, economically feasible, sustainable, socially just and responsible, and environmentally friendly, is a complex and multi-pronged challenge that requires a nuanced conversation at the nexus of energy, climate, air quality and health.

This session will highlight the need for addressing energy-air quality-climate-health together within a just transition framework in Africa. This nexus is specifically the focus for this session as these linkages, especially to air quality, will have multiple benefits yet they are often neglected or not prioritized in energy transition discussions. It is critical that air quality considerations are included in the just transition due to the large impacts of air pollution in Africa. Exposure to air pollution outdoors and in homes (due to the use of solid fuels for cooking) resulted in more than a million deaths in 2019 alone; in fact, ambient PM_{2.5} levels in many countries do not meet even the least stringent limit value (35 $\mu\text{g}/\text{m}^3$) recommended by the WHO Air Quality Guidelines.

Tuesday



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The feasibility of achieving the WHO Air Quality Guidelines (AQG) Globally

Date & Time: Tuesday 21 June 09:00 - 10:30 SAST (UTC+2)

Session type: Dialogue

Venue: Hybrid

In Person: Conference Room 1

Online: <https://attend.sri2022.org/meetings/virtual/62i7rRSorQWh2ZkTk>

Convenors: Raeesa Moola, Rajesh Kumar, Kirsty Ashworth, Forrest Lacey

Recently, the World Health Organization (WHO) updated their Air Quality Guidelines (AQG), based on the latest evidence from the epidemiological research community, that criteria air pollutants (e.g., ozone and fine particulate matter) can adversely affect human health; even at very low levels. The changes in AQG are expected to drive numerous changes in the national and international policies targeted at improving air quality. However, it is unclear whether the latest AQG can be achieved throughout the world given large heterogeneity in natural sources of air pollution; and whether intensification of efforts to achieve and sustain the new AQG in richer countries will further exacerbate inequalities between developed and developing countries. Another important dimension is to understand how climate change will affect various national/international efforts to achieve the latest AQG. Africa is at the highest risk of failing to achieving these new AQG; due to the presence of the Sahara Desert in its northern hemisphere; the large seasonal biomass burning activities and the heavy reliance on fossil fuel usage, in its equatorial regions and Southern Hemisphere - together with the lack of infrastructure to monitor, analyze, and predict air quality in most of the African countries.

Tuesday



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Urban Air Pollution and Health Impacts from Open Burning of Waste and Sustainable Management Strategies

Date & Time: Tuesday 21 June 13:30-15:00 SAST (UTC+2)

Session type: Dialogue

Venue: Online <https://attend.sri2022.org/meetings/virtual/mG9oRaiCFWdKxhLpa>

Convenors: Pallavi Saxena, Andriannah Mbandi, Langley Dewitt, Cathy Liousse, and Semeena Valiyaveetil Shamsudheen

Rapid urbanization and industrialization cause an exponential rise in solid waste generation across the world. About 11.2 billion tonnes of solid waste are collected worldwide and decay of the organic proportion of solid waste is contributing about 5% of global greenhouse gas emissions (Olivier and Peter, 2019). Poor infrastructure, land use regulations and poor waste management technologies leads to air quality and health-related issues. Landfill sites are a significant emission source of the greenhouse gases, methane and carbon dioxide and also emits smaller amounts of other trace gases (Verma et al. 2020). Moreover, open burning of wastes highly contributes to the budget of combustion aerosols (Christian et al., 2010, Keita et al., 2021). Some of these emissions are unhealthy for humans and other living organisms. In many developing countries, waste disposal sites are situated in the vicinity of urban areas, and they are major sources of diseases in adults due to incubation and reproduction of mosquitoes, flies and rodents which in turn, cause gastrointestinal, dermatological, and respiratory disorder (Li et al. 2014). In addition, it has been seen recently the role of waste burning aerosols on health of nearby population to landfill sites (Xu et al., 2019). Therefore, there is a stringent need for implementation of sustainable waste management (SWM) practices and improved sanitation systems that can improve the situation of waste particularly in developing countries. Taking in view of this problem, the Sustainable Development Goals (SDG) 3, 6 and 11 encourage waste minimization through extensive waste reuse, adoption of waste separation practices, promoting reducing, reusing and recycling (3Rs) activities. Furthermore, financing waste management projects to address the entire lifecycle of waste, municipalities need to be fully onboard with SWM policies and could be instrumental in developing public-private partnerships to offset the costs and to fund education campaigns to local people on the importance of waste separation (Nerini et al. 2019).

This session will 1) outline the impact on urban air pollution from solid waste generation and landfill sites which is further responsible for human health impacts, 2) give an overview of sustainable management options for solid waste disposal, waste segregation practices, recycling activities, improved sanitation methods, 3) highlight the promotion of awareness about waste management and 4) the incorporation of local community knowledge through participatory approach.

Tuesday

Agriculture, Urbanisation and Food Security



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Date & Time: Tuesday 21 June 15:00-16:30 SAST (UTC+2)

Session type: Dialogue

Venue: Online <https://attend.sri2022.org/meetings/virtual/ZsvNbThqSwBMaeumY>

Convenors: Semeena Valiyaveetil Shamsudheen, Evelyne Touré, Langley Dewitt, and Kirsty Ashworth

The World Bank estimate shows that by 2050, the world will need to feed 9 billion people that would require a sobering 70% increase in agricultural production (World Bank, 2012). Yields of staple food crops are falling in many regions across tropics with increasing temperatures and changing patterns of precipitation. Over 20% of Africans and nearly 30% of the population in sub-Saharan Africa are malnourished in 2021. Across sub-Saharan Africa almost two-thirds of the population rely on subsistence farming, and with prime agricultural land turned over to premium cash crops for overseas consumers by large corporations, food security is threatened. Population growth, poverty and starvation in rural smallholder communities is fuelling ever-increasing migration - resulting in rapid urbanisation and internal refugee crises. These shifts in population far outpace changes in urban and regional infrastructure, exacerbating difficulties in the urban food supply chain.

Climate change and associated extreme weather events only helps to escalate these issues and therefore pose a challenge in achieving United Nation's Sustainable Development Goals (SDGs) for a more future proof world. With current statistics given above on the poverty and hunger index in Africa alone, it appears unrealistic to achieve the goals by 2030 as it has planned initially. Even though the most effective way to achieve these goals is to embed these in each countries' planned activities from local departments to national levels, it is extremely challenging to get these policies into implementation level. We plan to address the SDGs 1, 2, 3, 11 and 12, which deal with poverty, hunger, good health, energy efficient cities and responsible consumption and production respectively which are having direct and indirect impacts due to climate change, poor agricultural practices, urbanization and thus food security all over world.

Wednesday

COVID-19 Outbreak & Linkage with Air Quality, Health and Policy

Date & Time: Wednesday 22 June; 17:00 – 18:30 SAST (UTC+2)



Session type: Dialogue

Venue: Online <https://attend.sri2022.org/meetings/virtual/A3C8FKJRhwdJYivQQ>

Convenors: Pallavi Saxena, Langley Dewitt, Saurabh Sonwani

The COVID-19 pandemic has put air quality into the public spotlight and created three natural experiments for atmospheric scientists: How does air quality respond to policy changes (e.g., reduced air and vehicular travel) in real time, how do ambient air pollution levels relate to respiratory illness outcomes, and how does indoor air quality and ventilation relate to airborne disease transmission. The information gained from scientific analysis and experimentation during the pandemic can be used to guide future policy on air quality, indoor and outdoor. At the outset of COVID, reductions in anthropogenic emissions during lockdowns appeared to lead to a decline in many air pollutants. However, some pollutants rose during periods of low anthropogenic emissions. Understanding the impacts of reduced anthropogenic emissions during COVID-19 lockdowns can be used as a guide to future air quality policy. Ambient air pollutants, particularly fine particulate matter has been suspected to increase the possibility of respiratory disorders and many findings have also reported that higher air pollution may have higher mortality rate with COVID-19 (Konstantinoudis et al., 2021). Additionally, air quality scientists have led the 'COVID is airborne' messaging and sparking a focus on indoor air quality and ventilation.

Thus, this session highlights 1) the linkage of COVID-19 with air quality, 2) health benefits and a way forward towards stringent policies on air pollution control and sustainability, 3) short-term effects of certain policies using COVID lockdown as a proxy. This session includes the lightning talks of eminent experts that will provide background about deep insights of air pollution problems and how COVID-19 outbreak and shut downs bring the brighter side of air quality and human health.

Thursday

Adapting low-cost sensor platforms to advance citizen air quality sensing for urban health in Africa

Date & Time: Thursday 23 June 15:00-16:00 SAST (UTC+2)



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Session type: Innovation Demonstration

Venue: Hybrid

In Person: Conference Room 2

Online: <https://attend.sri2022.org/meetings/virtual/4QRn5SQD28rxDsuYA>

Conveners: [UNEP](#) and [AirQo](#)

Air pollution is one of the major risk factors for global mortality and populations in Low and Middle-Income Countries (LMICs) such as sub-Saharan Africa face particular risks and yet effective management programmes have not been fully established. Low-cost sensor platforms have the potential to close the air quality data gaps in resource-strained settings such as Africa but the African context presents unique challenges for many low-cost sensor platforms. AirQo has developed and deployed low-cost sensors optimised to work in the African settings characterised by limited internet connectivity, unreliable power supply, and environmental factors such as dust, rain, humidity, and insects. At the same time, numerous efforts to advance the uptake of low-cost sensors are being implemented in Africa and face many challenges in sustaining operations. This session will employ rapid-fire presentations to showcase case studies from countries across Africa that are utilising low-cost sensor platforms. More specifically, a presentation of the UN open data management system (oDMS) highlighting interoperability of the AirQo, US Embassy and other reference stations. The session will be concluded by a Q/A session to capture participants input towards strengthening the service to be value-added.

Friday

Can low-cost sensors be adapted as novel approaches for advancing policy and citizen air quality sensing in Africa?

Date/Time: Friday 24 June 15:00-16:30 SAST (UTC+2)



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Session type: Dialogue

Venue: Hybrid

In Person: Conference Room 2

Online: <https://attend.sri2022.org/meetings/virtual/P3iqqEK9p3Px7RRSP>

Convener: [AirQo](#)

Air pollution is an important health risk factor and populations in cities in the global south such as sub-Saharan Africa face particular risks of exposure to exposures to levels that greatly exceed the World Health Organization (WHO) health guidelines. In spite of the increasing evidence on the health effects of air pollution, effective air quality management in Africa is not yet fully developed due to limited monitoring infrastructure attributable to the cost implications. The emergence of low-cost sensor platforms has led to several monitoring initiatives in African cities but data access and availability attributable to unique challenges of low-cost sensors coupled with limited institutional capacity continue to be barriers to addressing the air pollution challenge.

This 90-min session convenes experts representing policy, research, and advocacy from the air quality landscape in Africa to explore consensus on the opportunities for low-cost networks to go beyond closing the data gaps but advocacy and policy development processes. More specifically, it will be an opportunity to co-create a scalable model for African cities that harnesses the core pillars of inclusive air pollution management.

