Editorial
Integrating Air Quality and Climate Change: A Policy Imperative for Human Well-Being and Equity for the G20

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South Africa has assumed the Presidency of the Group of 20 (G20) of the world's most significant economies in 2025 with a theme of "Fostering Solidarity, Equity and Sustainable Development." During this period, the Academy of Science of South Africa (ASSAf) has led discussions among the academies of the G20 countries including the African Union in a process known as the Science 20 (S20). The theme for the S20 is "Climate Change and Well-being." In February 2025, ASSAf hosted a series of discussions with the aim of producing a Communiqué for submission to the G20 Summit in September 2025.

The editorial team of the Clean Air Journal has felt it appropriate to draft an editorial in support of this process and to highlight the importance of including air pollution in a material way, as it has a large impact on well-being and equity. Decreasing pollution should be a key tenet in fostering solidarity, equity, and sustainable development. This is particularly true in Africa, where under a business-as-usual scenario, air pollution is estimated to cause 930,000 premature deaths per year in 2030 and is projected to increase to about 1.6 million premature deaths per year in 2063 without increased and dedicated action (UNEP, 2023).

Air pollution exposure is unequal across countries and communities, and this leads to disparities in health impacts (Wang et al., 2023). These impacts are predominantly felt by the communities that are least responsible for the emissions, such as low-income and rural communities, which tend to be marginalised through poverty and have limited access to resources such as clean energy, health care and the social capital to effect political change.

Addressing air pollution does not happen in a vacuum and the CAJ community has an important role to play in the various dialogues around the G20 summit, taking place across academia, civil society and government. In a constrained economic environment, we are well placed to highlight how achieving the goal of clean air for all will address many of the major issues facing the global economy.

Well-Established Air Pollution and Climate Change Linkages

Deteriorating air quality is a symptom and driver of climate change impacts and has profound implications for human well-being, development, and societal justice, as well as impacts on agriculture and terrestrial and aquatic ecosystems. Air quality stands at the nexus of human health, equity, and climate change, with effects felt throughout the impact pathway from the emissions of atmospheric pollutants and greenhouse gases, their dispersion and transport, and the eventual impacts on the receiving environment.

For policymakers, addressing air quality is an imperative not only because it is a health necessity and can assist in safeguarding vulnerable populations, but also because it is a strategic entry point for accelerating climate action and addressing inequities. The burning of fossil fuels is a primary cause of climate change and simultaneously results in the production of atmospheric pollutants such as SO_2, NO_x and particulate matter. The impacts of climate change exacerbate the impacts of air pollution, through rising temperatures, changing atmospheric chemistry processes and reaction rates, and altering the frequency of climate-driven events, such as droughts and their concomitant dust emissions, as well as wildfires. For example, tropospheric ozone levels can increase in warmer conditions, exacerbating respiratory and cardiovascular disease. Wildfires (with frequencies potentially being altered by climate change) release massive amounts of pollutants, including ozone precursors and particulate matter, impacting air quality across wide geographical regions. Clean air is an imperative for policymakers, not only because it is a necessity for public health and can assist in safeguarding vulnerable populations; but also, because it is a strategic entry point for accelerating climate action and addressing inequities. While there is recognition of these inequities, there is a need to quantify the effects of air quality policies on disparities to ensure a targeted approach to reduce exposure (Wang et al., 2023).

Globally, air pollution results in millions of premature deaths annually (8.1 million in 2021; HEI, 2024), long-term

health impacts, and the associated health care costs, loss of productivity, and disruption to families and social networks. This highlights the intersectionality between public health, environmental justice, and climate justice.

Equity and Inclusion in Air Quality Governance

When the S20 considers policy guidance and interventions that address the nexus of air quality and climate impacts, equity must be embedded across interventions. There is a need for just transitions that consider the historical and current inequalities faced by women, children, and marginalized communities. Such transitions can be supported by policy and intervention processes that are participatory, context-sensitive, and informed by local knowledge systems. This includes recognizing indigenous perspectives and ensuring the right to clean air as a fundamental aspect of human dignity and development.

This also includes specifically addressing "air inequality" that exists within and between countries, where, as noted above, the poorest and most vulnerable are often exposed to higher levels of pollution. In addition, inequity is seen in the measurement of air pollution, with higher-income countries having an average of 1 air quality monitor per 370,000 people, while low-income countries had 1 per 65 million people (2018 figures; World Bank, 2022). Monitoring and data systems should also be improved to expand the network of observations and ensure that appropriate and timely data is available under FAIR data principles to inform decision-making and support accountability. This is especially important in underserved regions where early warning systems and public communication on air quality can empower communities to respond proactively to pollution events, but this is not possible without access to observational data.

Substantial Opportunities for Co-Benefits to Support Equity

There is a large body of work highlighting the immediate and long-term co-benefits for public health, climate mitigation, and economic resilience if air quality is improved. Policies and measures that reduce emissions of air pollutants can also lower greenhouse gas concentrations, and vice versa, making air quality improvements a cost-effective climate strategy; however, not all policies are win-win for air pollution and climate, and their holistic impacts should be assessed.

Such co-benefits have been highlighted in international assessments, such as the recent African assessment of air pollution and climate change that found measures in five key sectors of transport, residential energy, industry and power generation, waste, and agriculture could have massive positive impacts on emissions of GHGs and pollutants, ambient air pollution levels, human health, and crop yields (UNEP, 2023).

However, it is critical to not only consider and assess the measures, but also to quantify the impacts through their prioritization and implementation to ensure they are addressing and alleviating inequities (e.g. prioritising measures that decrease pollution in poorer communities) and not reinforcing historical inequities or developing new inequities (e.g. exporting of pollution). This calls for holistic and integrated assessments that consider impacts across the life cycle of interventions. Holistic approaches to integrated assessments allow policymakers to measure and report on disparities in air pollution exposure and the associate social and economic impacts with confidence.

Communities with lived experience of air pollution should be meaningfully involved in all aspects of addressing air pollution. This involvement ranges from the co-creation of government policies; using citizen science to collect data and drive awareness to also driving implementation of grassroots level initiatives.

Supporting International Collaboration on Air Quality

Currently, there is no international agreement on air pollution. Although improvements in air quality are included as metrics in the SDGs, air quality does not feature prominently. The S20 and G20 have an opportunity to elevate the prominence of air quality in international deliberations and to explicitly consider air pollution co-benefits and impacts when addressing climate change and human well-being. The outcome of the ongoing S20 discussions could promote regional and international cooperation, particularly among G20 and African nations, to share best practices and finance clean energy and air quality improvements in developing countries.

Clean air is a human right and a public good. Prioritising air quality across multiple sectors will equip governments to safeguard the health and well-being of communities. Implementing these policy interventions with an intersectional lens has the potential to reduce inequities and build resilient societies capable of thriving in a changing climate.

A commitment to clean air is a commitment to a healthier, fairer, and more sustainable future. Achieving this goal will require collaboration across G20 nations, particularly on the African continent where the air quality movement is gathering momentum.

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