Air Pollution Series

Actions on Air Quality in Africa

Executive Summary

Context

Air pollution is one of the biggest environmental challenges of our time. It comes from a number of different sources and has impacts across several sectors, including health, agriculture and economics. Globally, air pollution is responsible for 8.8 million premature deaths each year, resulting in a reduction of 2.9 years in average life expectancy (Lelieveld *et al.* 2020), and more than 90 per cent of these air pollution-related deaths occur in low- and middle-income countries, mainly in Asia and Africa. Due to the considerable impacts that air pollution has on human health and well-being, in Resolution 3/8, Paragraph 7(j), the United Nations Environment Assembly (UNEA) called on the United Nations Environment Programme Executive Director *"to undertake an assessment of progress being made by member States to adopt and implement key actions that can significantly improve air quality […]"*. This report forms part of this effort, and its focus is on actions taken by African governments to improve air quality.

This report reviews the actions carried out to control the emissions of air pollutants in the most important sectors, including industry and energy, transport, household energy, and forestry and agriculture. In addition, the review looks at the legislative and regulatory actions taken by governments to improve air quality. The information presented in this report was derived from governments within the region and complemented by literature reviews from both peer-reviewed and grey publications. A consultative forum bringing together air pollution actors from across the region was also held to validate the information.

Status and trends

As African cities, economies and populations continue to expand, the demand for energy, transport, food and other amenities will also increase. As these resources are some of the leading sources of air pollution on the continent, a corresponding deterioration in air quality is therefore also expected. Furthermore, the challenges presented by rapid urbanization (with the pressure it puts on existing infrastructure, such as waste management systems and transport corridors) and land-use change have the potential to exacerbate air pollution.

Africa
Photo credit: © Shutterstock/ Bildagentur Zoonar GmbH

Sectoral measures

Industrial emissions remain a significant source of air pollution and progress has been minimal since 2016
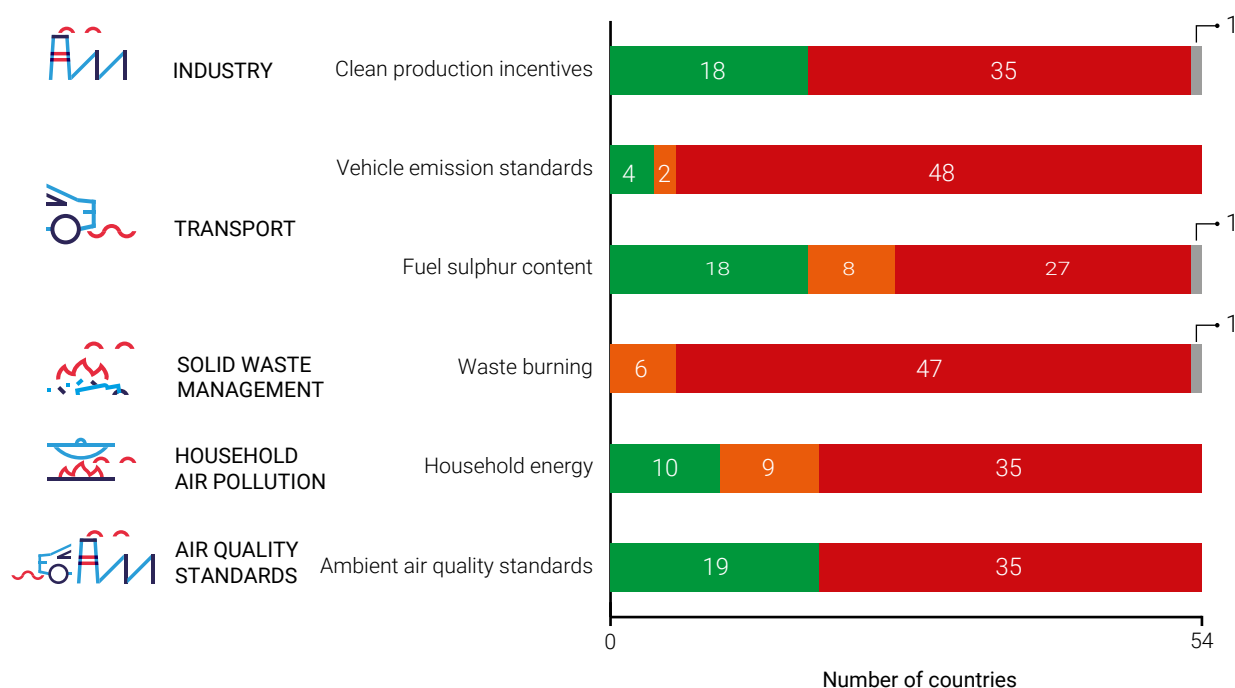
The energy and industrial sector showed minimal progress from the 2016 analysis, with no additional actions to reduce emissions from the industrial and energy sector recorded. However, governments are taking action to increase the share of renewable energy in their countries' energy mix. Some of the policy and regulatory instruments implemented to this end include feed-in tariff schemes, tax breaks for the importation of renewable energy technologies and a number of incentives to encourage cleaner energy production.

Despite these incentives, cleaner production practices are not widespread in the continent. This is partially due to the fact that most businesses that carry out industrial activities in Africa do not have a broad capital base, which limits the investment they can make in new and efficient technologies. As a result, there is a need to go beyond offering regulatory and fiscal incentives in order to spur investments in cleaner production, in the energy sector in particular.

According to the 2016 report's analysis of actions to improve air pollution, 18 countries had established fiscal and regulatory incentives to minimize industrial emissions. In the 2021 analysis, this number had not changed, suggesting that more work needs to be done to make countries aware of the need to support private-sector companies in reducing their emissions.

Figure 1. Progress towards adoption of key actions that can significantly improve air quality

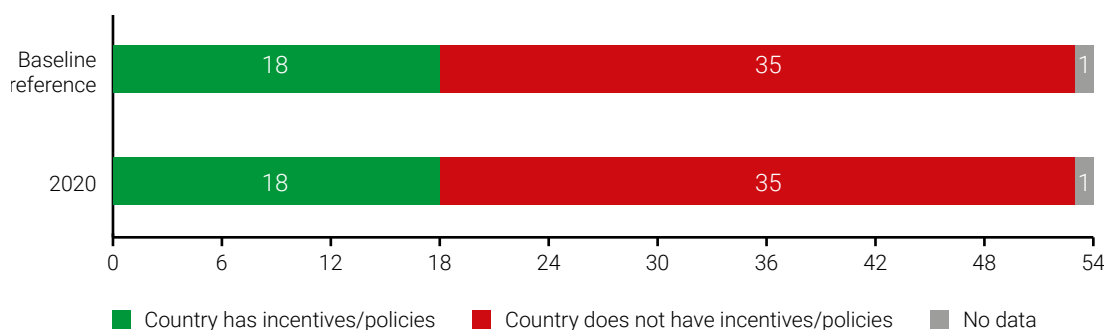### Where is the Africa region in taking action to improve air quality?

INDUSTRY	Clean production incentives	18 / 35 / 1
TRANSPORT	Vehicle emission standards	4 / 2 / 48
	Fuel sulphur content	18 / 8 / 27 / 1
SOLID WASTE MANAGEMENT	Waste burning	6 / 47 / 1
HOUSEHOLD AIR POLLUTION	Household energy	10 / 9 / 35
AIR QUALITY STANDARDS	Ambient air quality standards	19 / 35

Number of countries (0 – 54)

Source: UNEP survey data[1]

Actions to minimize emissions in the transport sector are aimed at reducing tailpipe emissions of air pollutants and have focused on improving fuel quality and establishing vehicle emission standards

Road transport recorded the most significant improvement towards reducing emissions. This was driven in part by an agreement formed between 13 countries within the Southern African Development Community economic bloc to adopt clean fuels and vehicle emission standards. In the agreement, which is to be implemented by the end of 2022, the countries resolved to limit fuel sulphur content to 50 parts per million (ppm) or less and adopted a vehicle emission standard equivalent to Euro 4/IV.

Since 2016, the transport sector has made a lot of progress in reducing emissions, with three more countries (in addition to Morocco) adopting vehicle emission standards that go over and above Euro 4/IV: Nigeria, South Africa, and Rwanda (see figure 4). The sector also saw a considerable improvement in fuel quality as 11 countries—Namibia, Benin, Zimbabwe, South Africa, Nigeria, Ghana, Lesotho, Eswatini, Malawi, Mozambique and Zambia—began regulating diesel sulphur content to 50 ppm and below, with most moving from the 51 to 500 ppm diesel sulphur content category, as reported in 2016. Ethiopia and Egypt also moved from the above 500 ppm category to the 51 to 500 ppm category.

Figure 2. Countries with incentives or policies promoting cleaner production, energy efficiency and pollution abatement for industries

Baseline reference	18	35 / 1
2020	18	35 / 1

0 6 12 18 24 30 36 42 48 54

■ Country has incentives/policies ■ Country does not have incentives/policies ■ No data

Source: UNEP survey data

---

1 From the analysis of UNEP data, a set of key policy actions were identified that, if adopted, would significantly improve air quality. The figure indicates how many countries have adopted these policies (green), are on their way to adopting them (orange/yellow) or have yet to adopt or implement them (red). Grey indicates that no data were available.

Figure 3. Countries with standards to limit diesel fuel sulphur levels
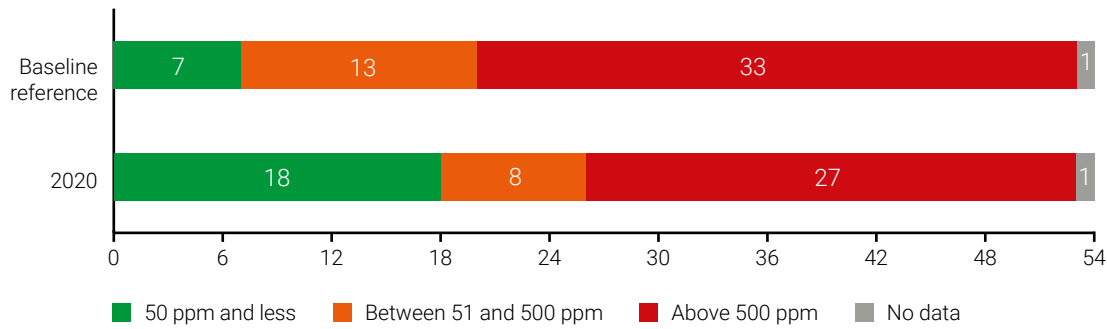
Source: UNEP survey data

Open burning of waste remains a major issue of concern and minimal action has been taken to reduce this practice
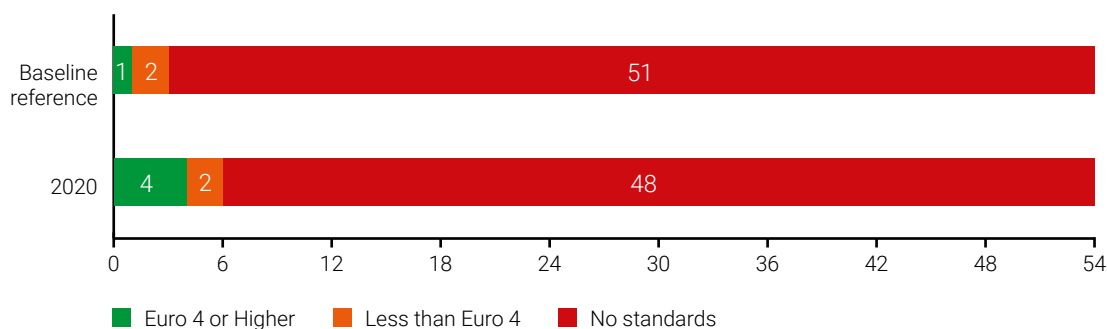
Minimal action was taken in the waste management sector, which remains one of the leading causes of deteriorating air quality, especially in urban areas. The number of countries where open burning of waste is practised increased from the 2016 baseline, mainly as a result of increased data availability, which also resulted in a drop in the number of countries in the "no data" category. Open burning of waste in the region can be attributed to the limited efficiency of waste collection in most countries and in large and mid-sized cities in particular, which leaves most residents and housing organizations responsible for managing their own solid waste.

Open waste burning takes place despite the presence of established policies, legal frameworks and municipal ordinances prohibiting it, suggesting that these regulations are only weakly enforced. This is due to a number of factors, including weak institutions, low technical and financial capacity of institutions, weak legislation, limited public awareness, political instability, and lack of political will (Ferronato and Torretta 2019). Several countries are in the process of establishing additional policy and incentive frameworks to encourage waste reduction and on-site recycling. Some of these frameworks include the circular economy, which has been adopted by various entrepreneurs on the continent.
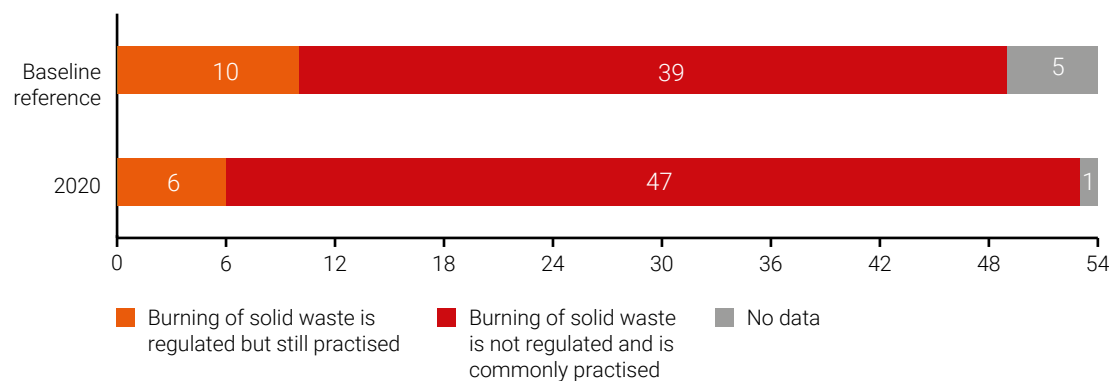
Even though governments are focused on increasing access to clean cooking, progress has been slow and gains made are often counteracted by population growth

The region also recorded improved access to clean cooking fuels, with 17 per cent of the population, on average, having access to clean cooking solutions — an increase of 2 per cent (25 million people) between 2015 and 2018. However, this gain was below the population growth rate for the period, so progress on this front is still minimal. The leading cause of indoor air pollution is the use of biomass-based fuels to meet household energy demand for cooking, lighting and heating. Of these, cooking is the main driver for biomass-based fuel demand in the region as the need for heating is minimal and there are several lighting options that households can access, although some of these lighting technologies use fossil fuels, which can also cause considerable indoor air pollution. Most of these biomass-based fuels are burned in inefficient cookstoves in poorly ventilated houses, which worsens their impact.

Historically, addressing the challenge of indoor air pollution has been a priority for most governments in the region, which have focused many of their interventions on increasing access to non-solid fuels and clean cookstoves. Despite this, minimal progress has been made in increasing the use of clean cookstoves or non-solid fuels at the household level for reasons such as

Figure 4. Countries meeting Euro 4/IV vehicle emission standard

Source: UNEP survey data

Figure 5. Countries with solid waste burning regulations

	Burning of solid waste is regulated but still practised	Burning of solid waste is not regulated and is commonly practised	No data
Baseline reference	10	39	5
2020	6	47	1

Source: UNEP survey data

Figure 6. Percentage of population with access to clean cooking solutions

	Above 71%	31 to 70%	Less than 30%
Baseline reference	10	8	36
2018	10	9	35
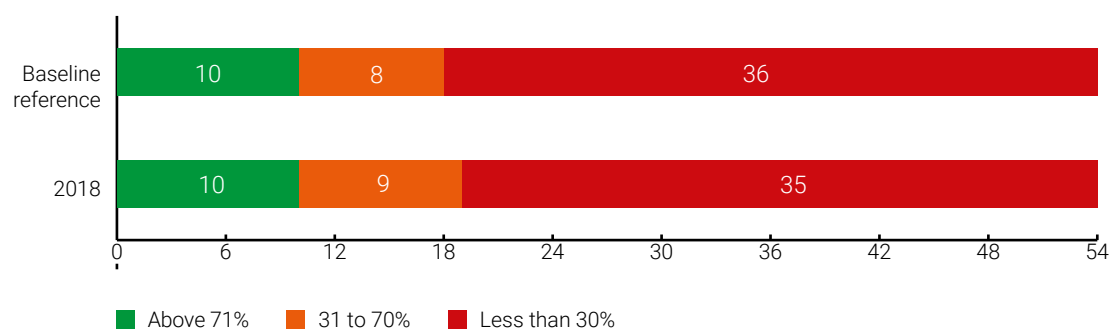
Source: International Energy Agency, 2019[2]

economic and sociodemographic factors, fuel availability, attitudes towards technology, awareness of the risks of traditional cookstoves and the benefits of adopting new technologies, location, and social and cultural influences (Vigolo, Sallaku and Testa 2018).

Slash-and-burn remains one of the major sources of air pollution in the region. However, several countries have recently recorded a drop in the practice, which has resulted in significant improvements in ambient air quality, especially in rural areas during the dry season

The forestry and agricultural sectors remain a major source of air pollution due to bush and grassland fires, and this is expected to continue in the near future as demand for food and therefore agricultural land continues to grow. Slash-and-burn is one of the most common practices employed by farmers on the continent to clear their land. It can also lead to bush and forest fires, which are fairly common in the continent, especially during the drier months. These fires make Africa the leading region in terms of areas burned per year, representing more than 70 per cent of the global total (Alonso-Canas and Chuvieco 2015). Due to the

scale of these fires, their impact on air pollution is felt not just locally and regionally but also globally, and they contribute up to a third of the Earth's biomass-burning aerosol particles. These emissions are also estimated to cause more than 43,000 premature deaths on the continent each year (Bauer *et al.* 2019).

Furthermore, these fires are a major source of nitrogen oxide emissions, contributing more than half of the continent's total, equivalent to 4 Tg annually (Jaeglé *et al.* 2004). Most of these fires occur in the northern and southern bands of savanna, the forest-savanna mosaic and woodland ecoregions. Figure 7 below shows the extent of burned areas in the different countries in the region.

Several studies have identified the kind of support systems that would encourage a switch from slash-and-burn to conservation agriculture or more sustainable land-clearing practices. Some of these support systems include educating farmers through extension services (Schuck *et al.* 2001) and helping farmer to acquire quality inputs. These practices are widespread in many countries across the continent, but their main focus is usually to increase land productivity and not to reduce emissions from fires.

2   International Energy Agency (2019). Africa Energy Outlook 2019. Paris

Figure 7. Acreage of burned areas per year

Burned Areas
- <Million Ha
- 1 to 5 million Ha
- >5 Million Ha
- No data
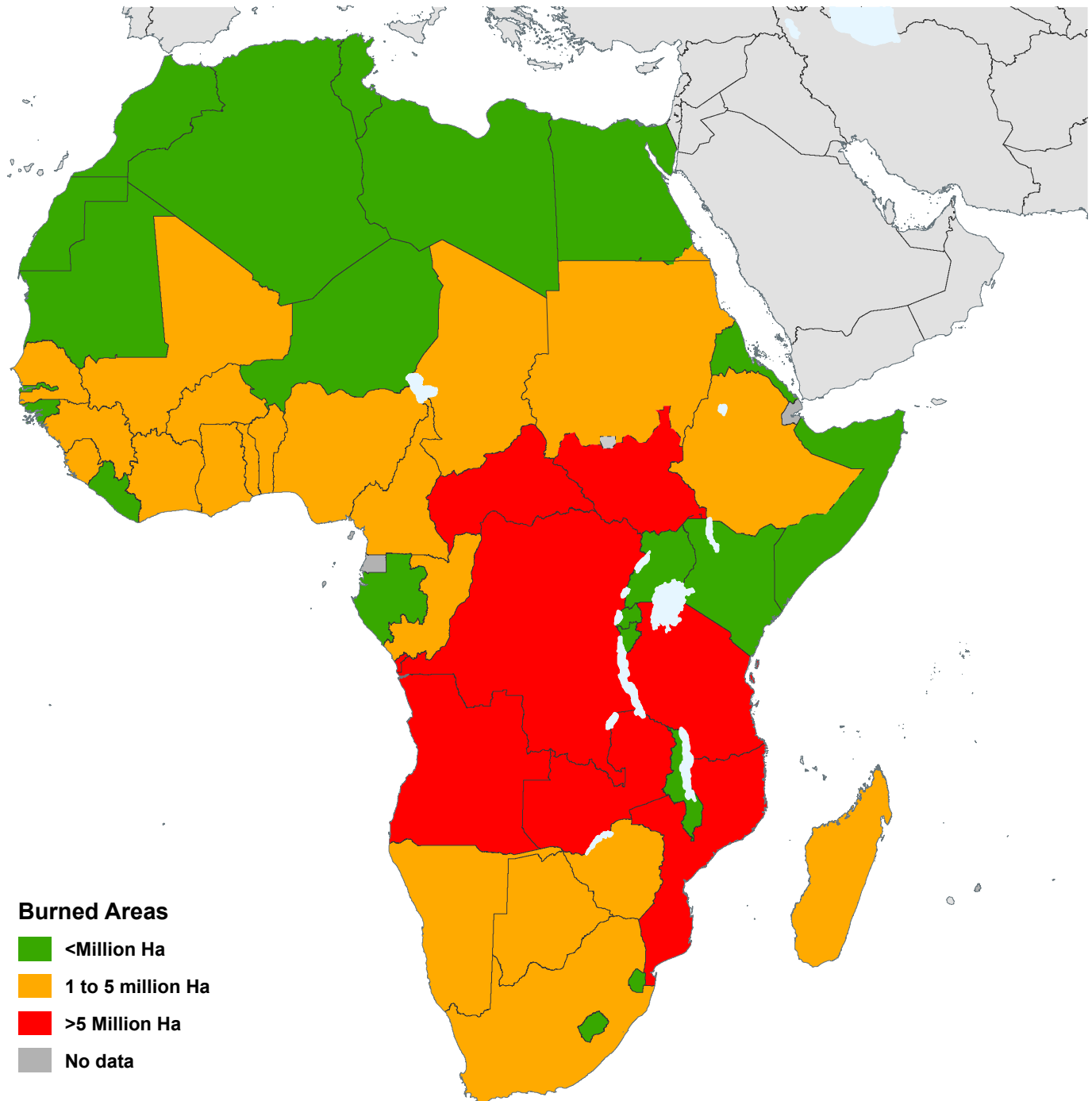
Source: FAOSTAT, 2019

In the recent past, a few countries have recorded a reduction in emissions from slash-and-burn practices and this has been attributed mainly to rural-to-urban migration (Hickman *et al.* 2021). This migration reduces demand for land as people find alternative livelihood options in urban centres. This is also closely linked to the growth of urbanization on the continent, and with projections indicating that 50 per cent of Africans will reside in urban areas by 2030, it is feasible that emissions from this source will reduce significantly in the future. However, due to the level of emissions associated with slash-and-burn, there is a need for urgent policy and programmatic interventions to encourage farmers to adopt sustainable agricultural practices that have minimal impacts on air quality and other natural systems.

3   https://www.fao.org/faostat/en/#data/GT/visualize (accessed on June 14, 2020).

Figure 8. Countries with ambient air quality standards embedded within a legal instrument
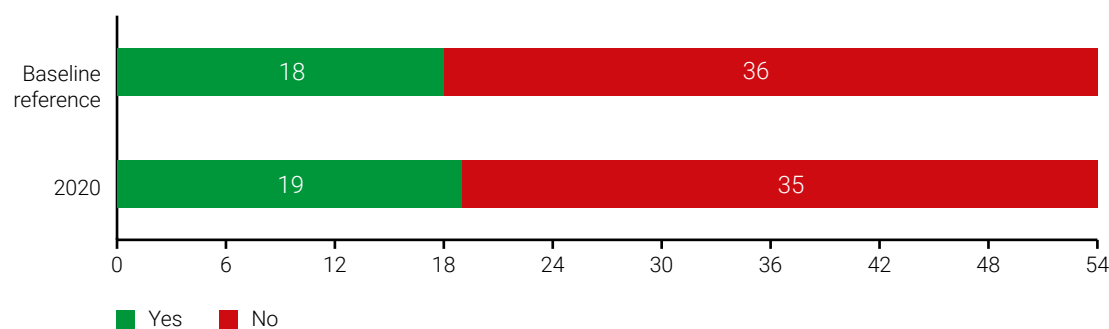
Source: UNEP survey data

Non-sectoral approaches

There is minimal progress in the number of countries with policy and regulatory frameworks to support air quality management. In countries where these frameworks exist, they are not widely implemented

Only 19 countries in the region have established legally enforceable ambient air quality standards. The enactment of specific air pollution control laws in the continent is still not widespread and, as a result, air quality in most countries is managed through other environmental laws and regulations. In countries with legally enforceable ambient air quality standards, the most commonly monitored air pollutants are particulate matter (both coarse and fine), sulphur dioxide (SO_2), lead (Pb), nitrogen dioxide (NO_2), nitrogen monoxide (NO), ozone (O_3) and some volatile organic compounds.

Even though some countries have made progress in establishing legally enforceable ambient air quality standards, several technical and policy challenges mean that they have still not been widely implemented. One of the major challenges reported by countries is the lack of technical and financial capacity to carry out continuous air quality monitoring, even in major urban areas, which limits the enforcement of the ambient air quality standards as there is no evidence available to inform policy or legal action. The poor availability of monitoring stations can be attributed to factors such as the high cost of acquiring and running standard air pollution monitoring stations. However, several low-cost monitors have recently emerged, which can be used by air quality managers to evaluate and monitor air pollution trends in a given airshed. Even though these low-cost monitors may not be used to inform legal action, they can help to identify hotspots and general air pollution trends, which can themselves be used to inform the need for policy and regulation in support of air quality management. In addition to limited continuous monitoring, many countries also face a personnel capacity challenge, whereby institutions responsible for managing air pollution do not have employees who are adequately trained on air pollution management.

Conclusion

This analysis and the slow pace of action indicate that air pollution in the region is likely to worsen in the near future as a result of rapid economic and population growth. The enactment of the proposed African Continental Free Trade Area is expected to play a major role in driving air quality policies and actions across the continent. However, the framework also has the potential to accelerate air pollution in the region as it is expected to accelerate economic activities that may increase air pollution emissions. Moreover, following the global COVID-19 pandemic, evidence has emerged that points to higher fatalities in communities exposed to chronic levels of air pollution. As the continent formulates post-COVID-19 strategies to build back better, it is therefore important to prioritize air quality management in green recovery plans as actions to improve air quality have multiple benefits and contribute to a number of other Sustainable Development Goals (SDGs), such as improving access to clean and renewable energy (SDG 7), reducing poverty (SDG 1), improving health (SDG 3) and creating sustainable cities and communities (SDG 11). While actions towards improving air quality in the region since the last similar report in 2016 have been minimal, if Africa is to achieve its ambition of sustainable development, as set out in Agenda 2063 and the 2030 Agenda, there is a need for accelerated action to improve air quality across the continent.

A waste picker is collecting reusable or rec
Photo credit: © Shutterstock/ MOHAMED ABDULRAHEEM