



# THE STATE OF AIR QUALITY IN BRAZIL

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## EXECUTIVE SUMMARY

### Key points

- Atmospheric pollution is an issue of the utmost relevance to Brazil. Pollution is responsible for jeopardizing the health of humans and the environment. It is a complex challenge that involves cross-cutting fields in several sectors of the economy and has greater impact on the most vulnerable portions of the population, like children and the elderly.
- This study systematizes and analyzes current scientific knowledge as to air quality in Brazil and highlights possible paths towards the country advancing in terms of atmospheric pollution control. The study points out a relevant collection of technical and scientific production in the area of air quality, especially in its interface with health. It also identifies significant gaps in areas, such as the economy and the implementation of public policies.
- There are feasible paths towards reducing the emission of atmospheric pollutants, with the control of emissions originating especially from transport, industrial processes and slash-and-burn practices, essential to social and economic development and the mitigation of climate change.
- The study reveals that Brazil already has a legal framework to structure an air quality management system. Even so, there is an urgent need for this framework to be backed by greater legal security, to set aside resources, to create a clear and mandatory schedule for the deployment of next phases for domestic air quality standards and to create clear incentives for the implementation of the tools laid out in said framework.

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## Context

Air pollution is a major challenge for the cities and states of Brazil as a whole and is responsible for more than 51,000 deaths per year, according to a report published by the Pan American Health Organization (PAHO, 2018).

**Historically, air pollution control has been treated as something restricted to environmental issues, though advancements in scientific knowledge show that the challenge goes far beyond and is cross-cutting in areas strategic to the sustainable development of Brazil.** New studies and policies that tackle the issue on a wider scale, encompassing sectors like the economy, health and climate, are fundamental to better understanding and managing air pollution throughout the nation, in both urban and rural areas of Brazil.

**The impacts of air pollution on human health are connected to premature death rates, lung disease, heart disease, strokes, while increasing the risk of cancer and diabetes, not to mention jeopardizing the cognitive development of children and dementia among the elderly.** These impacts are well established within scientific knowledge and more deeply impact vulnerable groups, like children and the elderly. The health sector is notoriously lacking in terms of air quality governance at a national level.

**Air pollution negatively affects the Brazilian economy due to a fall in worker productivity, premature deaths, restrictions to acquiring cognitive abilities necessary to education and drops in agricultural productivity.** Estimates are that the cost associated to premature deaths in 2015 equaled 3.3% of Brazil's Gross Domestic Product (Roy and Braathen, 2017). Additionally, the tropospheric ozone is responsible for considerable loss in agricultural production, especially in peri-urban areas and those affected by slash-and-burn practices associated to altering land use.

**Pollutants like ozone and black carbon contribute both to air pollution and climate change.** This compounding of adverse effects reveals that gains in controlling these pollutants, known as short-lived climate pollutants (SLCPs), foster benefits in terms of air quality, while also mitigating climate change.

**In the transport sector, road modalities are chiefly responsible for local pollution, considering cargo and passenger transport**

**involving trucks and automobiles.** To reduce emissions from this sector, technological advances are required for vehicles and fuels, along with robust strategies and policies for territorial and logistics planning to reduce the dependency on these forms of transport.

**The industrial and transport sectors are major pollutant emitters in Brazil due to the burning of fossil fuels.** Industrial development, coupled with urban expansion, has caused a rise in emissions associated to burning fossil fuels and biofuels, which, in turn, increased atmospheric pollution at all levels – local, regional and global –, jeopardizing the population's health.

**Slash-and-burn practices involving local vegetation and forests are a reality throughout Brazil. These slash-and-burn practices negatively impact the population's health, emit greenhouse gases (GHG) and threaten economic development.** The biomes of the Amazon, Pantanal and Cerrado regions are severely affected by changes in the use of land and due to slash-and-burn practices, though this reality is not restricted to these biomes. Deforestation in the Amazon is a leading source of greenhouse gas emissions in Brazil.

**There is a noted rise in the use of firewood for cooking in the home.** The use of firewood as fuel certainly calls for attention as, in 2018, about 14 million families used firewood or charcoal, a rise of 3 million homes when compared to 2016, according to the Brazilian Institute of Geography and Statistics (IBGE, 2019).

**Brazil has a series of laws and regulations that establish measures for air quality management and the control of pollution, though most of the regulatory base that sustains the National Air Quality Program (Pronar) is infralegal, as it is only cited in National Council on the Environment (Conama) resolutions.** This represents a significant obstacle to the creation of a national policy on air pollution control that is veritably robust, integrated and transparent and, also, jeopardizes legal security for those to whom it applies (emitters).

**A national system for environmental monitoring and sharing data are key to managing and implementing air quality policies based on cutting-edge scientific knowledge.** Brazil still faces important challenges in the development of a comprehensive monitoring program, with pollutant

inventories and air quality modeling and forecasting. There are new tools and technologies that must be implemented to advance in this direction, especially in data science and the use of remote sensing.

**There is a significant gap between the responsibilities established by Pronar and the deployment of tools at a state level.** Although the national program requires federal/state entities to deploy a series of tools and policies, these simply have not come to fruition. This is a structural challenge in the management of air quality in Brazil and calls for wider studies in relation to bottlenecks and the means to overcome them.

The aim is that this study fosters important steps towards leveraging the ecosystem of research on air quality in Brazil, while strengthening the debate of related policies.