

Forum: Environment Commission

Issue: Innovative approaches to reduce air pollutant concentrations in major Asian cities

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Introduction

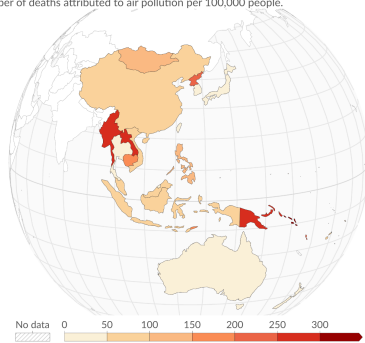
Air pollution has always been recognized as one of the most critical environmental issues faced by various Asian major cities. There are several factors that contribute to the emergence of the problem. Rapid urbanisation, growing population, increasing demand for energy and transportation can together cause the high concentrations of pollutants known as fine particulate matter, nitrogen oxides, sulphur dioxide, carbon dioxide and ozone. According to the World Health Organisation (WHO), approximately 99% of world populations are currently breathing under the air that already exceeds its air-quality guideline levels. Meanwhile, air pollution would also contribute to around 7 million premature deaths for each year (WHO, 2025).

This issue becomes particularly significant in Asia due to the rapid urbanization, growing population and higher demand of transportation and energy. In 2024, the UNEP (United Nations Environment Programme) reported more than 90% of Asian region, approximately over 2.5 billion people, are constantly breathing under air that defined as unsafe by the WHO (World Health Organisation) More specifically, 98% of people from China, Japan, Laos, the Republic of Korea and Vietnam continue to suffer from air pollutants (UNEP, 2024).

Death rate from air pollution 2023

Estimated annual number of deaths attributed to air pollution per 100,000 people.

Our World
in Data



Data source: IHME, Global Burden of Disease (2025)

Note: To allow for comparisons between countries and over time, this metric is age-standardized¹.

OurWorldinData.org/air-pollution | CC BY

¹ Age standardization Age standardization is an adjustment that makes it possible to compare populations with different age structures, by standardizing them to a common reference population.
Read more: [How does age standardization make health metrics comparable?](#)

Death rates from air pollution are highest in Southeast Asia with Papua New Guinea and mainland Southeast Asia exceeding 250 deaths per 100.000 people in 2023 (IHME, Global Burden of Disease, 2025).

In addition, air pollution can also transport between administrative and national borders, meaning that individual cities could not always address the problem individually and collaboration is considered. Pollutants can easily be transported across nations through the atmosphere, and neighbouring emissions from neighboring areas may contribute to poor air quality within a city or country. Thus, regional cooperation, shared monitoring and exchange of information become increasingly important. On July 1st 2026, eleven countries across the Asia-Pacific region joined the WHO regional roadmap of practice, aiming to reduce the growing health burden that is associated with air pollution and climate related heat. (WHO, 2026).

Definition of Key Terms

Air pollution:

The excessive amount of chemical agents and pollutants contained in the air that have a negative impact on human health and environment. (WHO, 2026).

PM2.5:

Particulate matter that has an aerodynamic diameter of 2.5 micrometres or even less. Because of its small size, PM2.5 has the ability to penetrate deeply into the respiratory system and is strongly associated with adverse health effects (WHO, 2021).

Air pollutant:

Chemical, physical and biological substances or agents present in the atmosphere that have an adverse effect on human health, ecosystem or environment. Major pollutants include ozone, nitrogen dioxide, sulphur dioxide and carbon monoxide (WHO, 2026).

PM10:

Particulate matter that has an aerodynamic diameter of 10 micrometers or less. Another key indicator used to measure urban air pollution (WHO, 2021).

Air quality:

The state of the atmosphere relating to the concentration of pollutants and their potential effects on human health and environment.

Airshed:

A geographical area in which air pollutants may circulate and affect other areas, meaning that pollution should be addressed through cooperation between neighbouring jurisdictions.

Background Information

Origins and major sources of urban air pollution

Air pollution in Asian cities is closely connected to rapid economic development and urbanisation. Motor vehicles, electricity generation, industrial activities, construction, waste burning and residential fuel combustion are usually viewed as some major sources of outdoor air pollution. Fossil-fuel combustion is also particularly important, because it can release particulate matter and gaseous pollutants which contribute to climate change (WHO, 2026).

Air pollution also creates unequal health impacts across populations. According to WHO (World Health Organisation), health impacts of air pollution affect vulnerable and disadvantaged groups disproportionately, including women and young children. In the WHO South-Asian Region, household air pollution remains the major concerns, with an average of 63% of households exposed to unacceptable levels of household air pollution (WHO, 2026)

Scale and impact of the problem

The WHO Ambient Air Quality Database, which was updated in June 2026, compiles annual mean urban concentrations of PM_{2.5}, PM₁₀ and NO₂ using official national and substantial data, government reports and other reliable sources. These pollutants were therefore measurable indicators through which cities can assess progress (WHO, 2026).

WHO recommends an annual mean concentration of only 5 µg/m³ for PM_{2.5}, 15µg/m³ for PM₁₀ and 10µg/m³ for NO₂. These guidelines values are health-based indicators rather than legally binding international standards (WHO, 2021), and the gap between recommended values and national standards values remains a major challenge. Moreover, WHO's 2026 review of the Pacific Region emphasizes the need to strengthen air-quality standards and improve implementations.

Previous international efforts

The WHO (World Health Organisation) has initiated numerous international measures to mitigate the health impacts caused by air pollution. In January 2025, the 78th World Health Assembly adopted an updated Road Map aimed to Enhanced Global Response to the negative health impacts by air pollution. The roadmap marked the voluntary target for countries in order to reduce the health impacts of anthropogenic air pollution by 50% in 2040 based on 2015 baseline values. It also concentrates on improving evidence, monitoring, strengthening institutional capacity, measuring progress and increasing international cooperation (WHO, 2025).

Organisation and Countries involved

UNEP (United Nations Environment Programme)

UNEP firmly fosters international environmental cooperation and has generated regional assessments or policy recommendations for reducing air pollution in Asia and the Pacific. The Asian Pacific Clean Air Partnership provides a platform for governments and other stakeholders to exchange knowledge and develop clean-air measures.

WHO (World Health Organization)

WHO provides health-based air-quality guidelines, maintains a global air-quality database and supports governments in assessing the health effects of pollution. Its 2025 Road map places greater emphasis on monitoring, evidence, and coordinated action.

ASEAN (Association of Southeast Asian Nations)

ASEAN is particularly relevant to air pollution because transbordering haze demonstrates how air pollution can cross nations' borders. Its regional agreements provide mechanisms for information-sharing, monitoring and joint responses.

India

India contains several rapidly growing metropolitan areas facing significant particulate pollution. For instance, Mumbai just developed an Air Pollution Mitigation Plan in 2023 in response to rising pollution associated with construction and infrastructure projects, uncle fuel use, etc. This plan included measures to reduce pollution from construction projects and established a relevant mechanism system. Its experience demonstrates the importance of combining transport, industry, energy, construction and waste management policies.

Indonesia

Indonesia is significantly relevant to transboundary haze since land and forest fire could affect air quality to a large extent across Southeast Asia. Its participation in ASEAN (Association of Southeast Asian Nations) mechanisms makes it an important actor in regional cooperation.

Japan

Japan is highly relevant to regional air-pollution cooperation because it have extensive air-quality monitoring network and established environmental regulations. In 2024, Japan reported 1782 air-quality monitoring stations nationwide and continued to provide real time PM2.5.

Possible Solutions

1.Establish regional real-time air-quality monitoring networks

Asian cities could create networks of ground-based monitors and calibrated low-cost sensors around schools, hospitals, major roads and industrial areas, with data shared on a

regional data platform using common measurement standards. This will help to identify local sources of pollution and help governments assess the effectiveness of policies in reducing concentrations of different pollutants.

2. Develop AI-assisted pollution forecasting systems

Governments can combine monitoring data from local sensors, satellites, transport and weather dataset to forecast pollution trends. This could trigger some temporary measures such as low-emission zones, temporary inspection regimes for certain industries and issuing health warnings. In addition, those systems must be transparent and rely on credible data.

3. Create low-emission urban transport zones

Cities could create low-emission transport zones and promote cleaner public transport, cycling and walking, also discouraging the use of high-emission private vehicles at the same time. Governments should look to replace diesel buses with low or zero emission alternatives, and offer incentives for commercial vehicles that use cleaner technologies.

4. Strengthen industrial emission control

Industrial facilities could be required to install effective emission control technologies and regularly measure and report on major pollutants, with information published for public scrutiny. Adequate financial and technical support should be given to developing country cities to prevent these standards from exacerbating existing economic challenges.

5. Establish regional air cooperation

Cooperation between countries that share pollution pathways could be established, with mechanisms for data-sharing, research and coordinated response to pollution episodes. ASEAN's existing regional haze mechanisms could act as an initial model, which could be adapted for different types of pollutants.

6. Set up a Clean Air Innovation Fund

International organisations and Member states could set up a voluntary fund for supporting innovative clean air initiatives in lower-income Asian cities. It should be focused on helping cities generate and share successful local approaches and experiences, and prioritize projects that have measurable impacts on reducing PM2.5 PM10 or NO2 levels and can be replicated elsewhere.

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