Air Pollution in Bangladesh: Status, Sources, and Actions

AIR POLLUTION STATUS: LEVELS, TRENDS, AND KEY SOURCES

Air pollution remains a major environmental and public health concern in Bangladesh, for example, annual average $PM_{2.5}$ concentrations across all monitoring stations (Figure 1), exceed both the NAAQS and the WHO guidelines. Key sources of pollution include household energy, power plants, industry (especially brick kilns), transport and open waste burning (Figure 2).
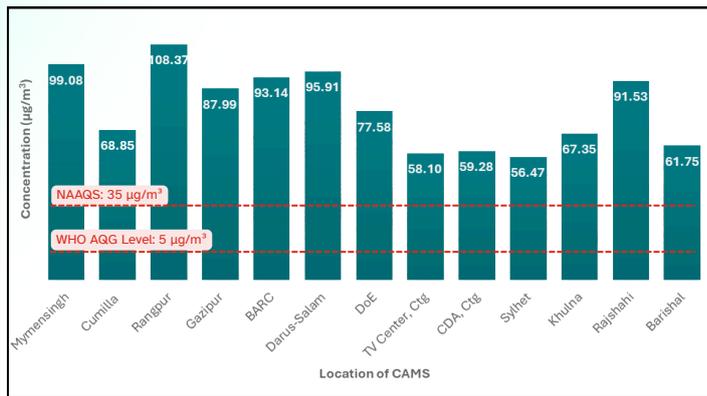

Source: DoE, 2025

Figure 1 Annual Ambient $PM_{2.5}$ at Monitoring Stations in Bangladesh (2019–2024)
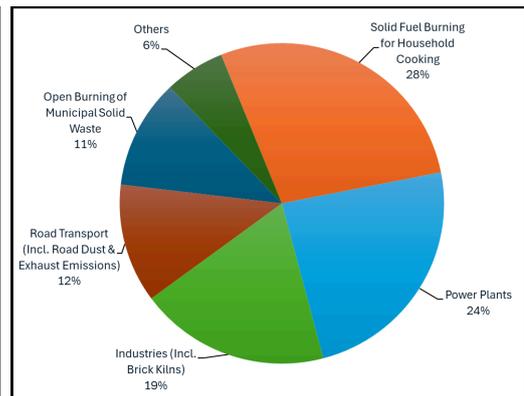

Source: World Bank, 2025

Figure 2 Key $PM_{2.5}$ Sources in Greater Dhaka Area

AIR POLLUTION MONITORING AND DATA AVAILABILITY

Currently, there are 31 stations under Bangladesh's air quality monitoring network. Among them, 16 stations are Continuous Air Monitoring Stations (CAMS) and the rest are Compact Continuous Air Monitoring Stations (C-CAMS), managed by the DoE. These stations measure key pollutants, including PM_{10}, $PM_{2.5}$, SO_2, NO_x, O_3 and CO, and are equipped with meteorological sensors.
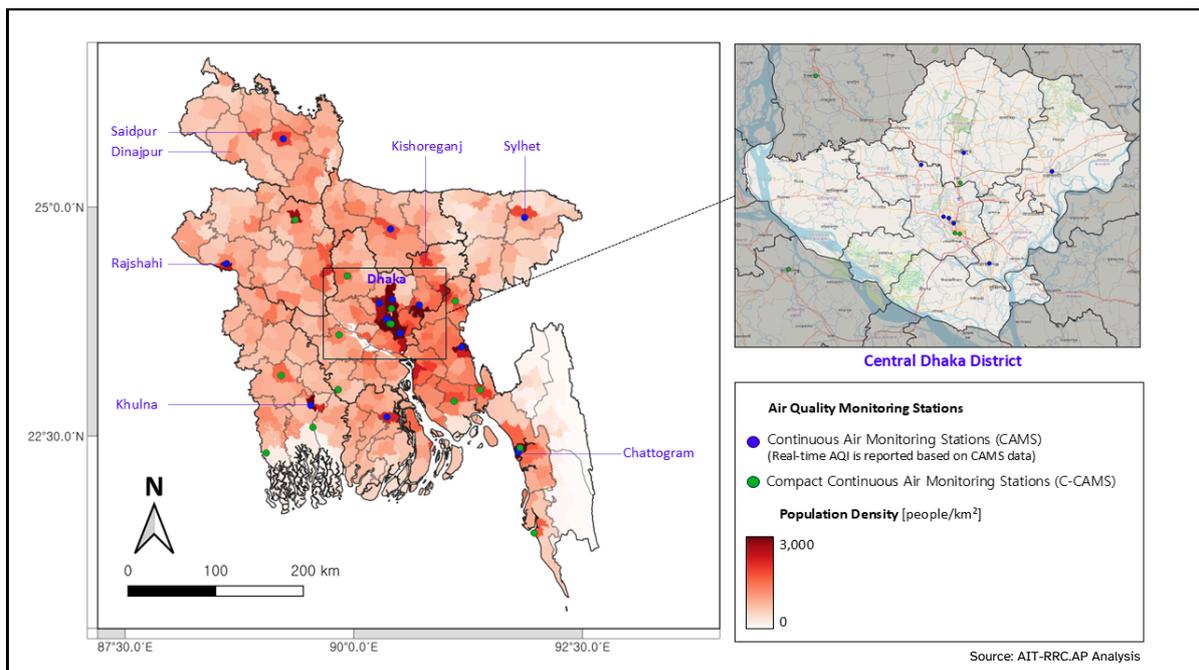

Source: AIT-RRC.AP Analysis

Figure 3 Air Quality Monitoring Station Network in Bangladesh

Acronym
AQG Level - Air Quality Guideline Level
DoE - Department of Environment
NAAQS - National Ambient Air Quality Standards

AIR POLLUTION MONITORING AND DATA AVAILABILITY (CONT.)

To assess the monitoring stations network coverage, the locations of monitoring stations were mapped against population distribution data (Gridded Population of the World, 2020). The results show that monitoring stations are concentrated in major urban areas such as Dhaka and the second-largest city Chattogram, while other densely populated cities, including Dinajpur, Saidpur, and Kishoreganj, remain without monitoring stations (Figure 3).

HEALTH AND ENVIRONMENTAL IMPACTS OF AIR POLLUTION

Evidence from multiple studies indicates that air pollution in Bangladesh has significant health, environmental, and economic impacts. For example, A study in Gazipur shows that air pollution from brick kilns causes vegetation stress, including reduced chlorophyll and changes in leaf biochemical indicators such as sodium, potassium and sugar content in plants growing near kiln sources (Tusher et al., 2018). In Dhaka, monitoring shows elevated PM_{10} concentrations, and plant-based assessment finds that the studied tree species are sensitive to particulate air pollution. (Jashim et al., 2020). A health assessment reports reduced lung function among rickshaw pullers in Dhaka, associated with exposure to urban air pollution, particularly $PM_{2.5}$ (Nayeem et al., 2020).

The World Bank estimates that air pollution causes over 159,000 premature deaths annually, with health costs equivalent to 8.3% of GDP (World Bank, 2024).

Similarly, the CREA estimates about 102,456 deaths annually and a loss of 4.8 years of life expectancy due to long-term $PM_{2.5}$ exposure. Figure 4 shows that reducing $PM_{2.5}$ concentrations under different guideline limits can significantly lower premature deaths, decreasing from about 102,456 at current levels (79.9 $\mu g/m^3$) to 83,238 under the national standard (35 $\mu g/m^3$), 50,035 under the WHO 2005 guideline (10 $\mu g/m^3$), and 21,176 under the WHO 2021 guideline (5 $\mu g/m^3$) (CREA, 2025).
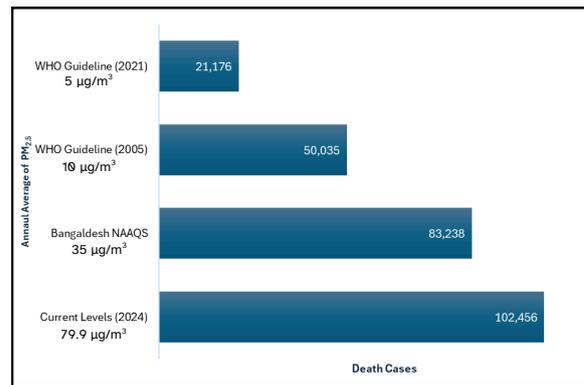

Source: CREA, 2025

Figure 4 Respiratory-related Deaths in Bangladesh

Asthma-related emergency room visits
670,000

Preterm births
900,000

Low birth weight cases
700,000

Workdays lost
262 Million Days

Economic costs from healthcare and productivity loss
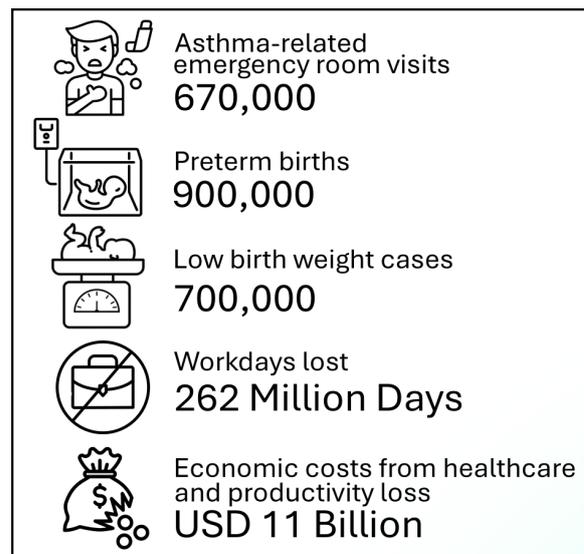USD 11 Billion

Source: CREA, 2025

Figure 5 Annual Health and Economic Impacts of $PM_{2.5}$ Exposure in Bangladesh

EMISSION INVENTORIES AND MODELLING CAPACITY

Bangladesh has made steady progress in developing emissions inventories for both greenhouse gases and air pollutants. Under its obligations to the UNFCCC, the country has submitted multiple National Communications, reporting national emissions using standard IPCC methodologies. In addition, sector-specific inventories have been prepared for key urban sources such as transport and brick kilns, and a national inventory of SLCPs, including BC and CH_4, was developed under the National SLCP Action Plan. As part of the National Air Quality Management Plan (2024–2030), the DoE plans to develop a national, gridded inventory of criteria pollutants and SLCPs, integrating data from multiple sources to strengthen air quality assessment, policy support, and mitigation planning.

EMISSION INVENTORIES AND MODELLING CAPACITY (CONT.)

Table 1 Available Emission Inventory in Bangladesh

Inventory	Base Year	Species	Method	Leading Institution
National Communications	1990–2012	National GHGs (CO_2, CH_4, N_2O)	IPCC Tier 1 & 2	MoEFCC & DoE
On-road Vehicular EI for Dhaka City	2012	CO_2, NO_x, CO, SO_2, PM, NMVOC, Pb, NH3, N2O, CH4, PAH, POPs, Total Dioxin, Total Furans	Bottom-up	Research Study by Iqbal A., et al., 2014
Brick Kilns EI in Dhaka Metropolitan Area	2010	$PM_{2.5}$, SO_2, CO, CO_2, BC	Bottom-up	Research Study by Guttikunda S. K., et al., 2012
SLCP Inventory	2010 (with projection for 2020, 2030 and 2040)	BC, CH_4	LEAP–IBC Toolkit	BUET & DoE, supported by CCAC
NAQMP Inventory	Under development	$PM_{2.5}$, SO_2, NO_2, NH3, BC, CH_4	Not yet available	MoEFCC & DoE

Atmospheric modelling studies have been undertaken in selected cities, including Dhaka, Chattogram, Rajshahi, and Sylhet, to support emission inventory validation, source understanding, and air quality planning. These studies have been carried out mainly by academic institutions in collaboration with the DoE. At the national level, modelling tools are being used to support mitigation assessment and policy planning, including under the National Air Quality Management Plan (NAQMP).

POLICIES, MITIGATION MEASURES, AND TARGETS

Bangladesh has developed the NAQMP (2024–2030), designed by the MoEFCC and the DoE, with financial and technical support from the World Bank. The NAQMP aims to achieve the WHO Interim Target-1 and the national annual $PM_{2.5}$ standard of 35 µg/m^3, and it supports the South Asia Clean Air Vision 2030.

The NAQMP aligns with national policies, including the Air Pollution Control Rules (2022), the National Action Plan for Reducing Short-Lived Climate Pollutants (2018), and Bangladesh's Nationally Determined Contributions (NDCs, 2021). Its implementation is expected to benefit the population of Bangladesh and the wider region, including the Indo-Gangetic Plains and Himalayan Foothills (IGP-HF), through improved air quality, public health, productivity, and climate co-benefits.

The World Bank also supports the Bangladesh Clean Air Project (BCAP). The BCAP Phase I focuses on strengthening air quality management and enforcement in power plants and heavy industries, improving vehicle inspection and emissions control, and modernizing bus services, including electrification in Dhaka. Phase II is planned, with additional measures such as clean cooking programs, technical assistance to provide financial incentives to reduce emissions from power plants and heavy industries, and the development of roadside infrastructure for bus services.

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KEY GAPS AND PRIORITY ACTIONS

Key gaps in addressing air pollution in Bangladesh include the need to expand and strengthen the air quality monitoring network, improve technical capacity and skilled manpower, and enhance the assessment of emission sources, including source apportionment. There is also a need to promote clean fuel and retrofitting public transport, energy use, upgrade industrial and brick production technologies, expand clean cooking solutions, and improve solid waste management, including reducing open burning.

Addressing these gaps requires stronger institutional coordination, adequate financial resources, and enhanced regional cooperation on transboundary air pollution, particularly through improved data sharing and monitoring in border areas. Continued capacity building and training are essential to support effective implementation.

These priority areas are reflected in the National Air Quality Management Plan (NAQMP 2024–2030) and are being supported through the Bangladesh Clean Air Project (BCAP), which focuses on strengthening air quality management systems, improving emissions control in key sectors, and promoting cleaner transport and energy solutions.

NOTES AND SOURCES

This factsheet is prepared by the Regional Resource Centre for Asia and the Pacific at the Asian Institute of Technology (AIT-RRC.AP), Thailand, as part of the scoping study for the revitalization of the Malé Declaration, commissioned by the South Asia Co-operative Environment Programme (SACEP). The information presented is based on available regional and global datasets, academic literature, official sources, and communications with relevant agencies. Feedback may be sent to Myatthu.Kyaw@rrcap.ait.ac.th.

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RRC.AP Website   Air Pollution Cluster (APC)   APC's Brochure

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Photos: Typical on-road transport in Bangladesh

ABOUT MALÉ DECLARATION

Malé Declaration on Control and Prevention of Air Pollution and its likely Transboundary Effects for South Asia (Malé Declaration) was adopted at the 7th Governing Council of the South-Asia Co-operative Environment Program (SACEP), held in Malé during April 1998, following a round-table policy dialogue held by United Nations Environment Programme (UNEP) and Stockholm Environment (SEI) in March 1998 at Asian Institute of Technology (AIT), Bangkok. Representatives of the Ministry of Environment from South Asian countries participated in the meeting, and agreed to initiate the intergovernmental network involving Bangladesh, Bhutan, India, Iran, the Republic of Maldives, Nepal, Pakistan and Sri Lanka. The declaration emphasizes the need for countries to carry forward studies and programmes on air pollution in each country, and has implemented activities in phases that aim to strengthen regional cooperation on transboundary of air pollution, and to build capacity in Air Quality Management across the member countries.