

# Air Pollution in the Hindu Kush Himalaya

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## Introduction

Air pollution has large impacts on the Hindu Kush Himalaya (HKH), affecting not just the health of people and ecosystems, but also climate, the cryosphere, monsoon patterns, water availability, agriculture, and incomes. It receives significant amount of air pollution from the Indo-Gangetic Plain (IGP).

Highlights of the chapter:

- Air quality has strong seasonal and diurnal cycles in most parts of the HKH, with a strong role played by meteorology.
- Air pollution varies by season.
- Major gaps in HKH air quality networks persist, and many large cities on the IGP still lack monitoring.
- Regional haze during the dry season, with persistent winter fog is one of the worsening problem in HKH.
- HKH is sensitive to global climate change through atmospheric dynamics and thermal forcing.

## Key Messages

- Air pollution has increased and air quality has worsened in the HKH; the causes include diverse pollutant sources—cook stoves, brick kilns, other industries, power plants, and transport—combined with rapid urbanization [Well established].
- Although research on HKH air quality has improved, major gaps remain because the region does not have enough air quality monitoring stations [Well established].
- Persistent winter fog leads to elevated air pollution and low visibility throughout the HKH and the Indo-Gangetic Plain (IGP) [Established but incomplete].
- The HKH is sensitive to global climate change—and air pollution within the HKH affects the cryosphere, the circulation of monsoons, and the distribution of rainfall over Asia [Established but incomplete].

## Policy Messages

- To mitigate air pollution and its severe socio-economic effects, clean technologies and infrastructure are essential investments; the HKH should focus on leapfrogging for sustainable development.
- Dedicated national institutions are required to adopt and implement air pollution mitigation policies, as well as to cooperate and collaborate regionally on transboundary air pollution issues.
- Education is essential—the HKH needs more mechanisms to enhance knowledge sharing, to increase responsiveness to scientific evidence, and to promote awareness and behavioral change



Burning of small piles of agricultural residue



Versus open-field burning

## Air pollution mitigation in the HKH will require three elements:

- Investment in clean technologies and green infrastructure.
- Dedicated institutions and policies, including for regional and transboundary collaboration and cooperation.
- Behavioral change, supported by knowledge sharing and responsiveness to scientific evidence.

## Air Pollution in the HKH and the SDGs

Air pollution mitigation must be part of any effort to meet the Sustainable Development Goals (SDGs), especially three: those on health (SDG 3), sustainable energy (SDG 7), and cities (11). To make the connection explicit, we propose three calls to action on air pollutants in the HKH:

- For SDG 3 (Ensure healthy lives and promote well-being for all at all ages): Take urgent measures to reduce household air pollution from cookstoves in the HKH.
- For SDG 7 (Ensure access to affordable, reliable, sustainable and modern energy for all): Ensure access to affordable, sustainable, and improved clean fuel for all people in the HKH.
- For SDG 13 (Take urgent action to combat climate change and its impacts): Reduce emissions of short-lived climate forcers—especially BC —by reducing emissions from brick kilns and diesel trucks in the HKH.



Multiple pollutants and their multiple adverse effects. (Cao et al. 2013, adapted by Clean Air Asia 2016)

