

ON KNOWLEDGE: 5

Tackling climate change and air pollution together

Comparing climate change and air pollution

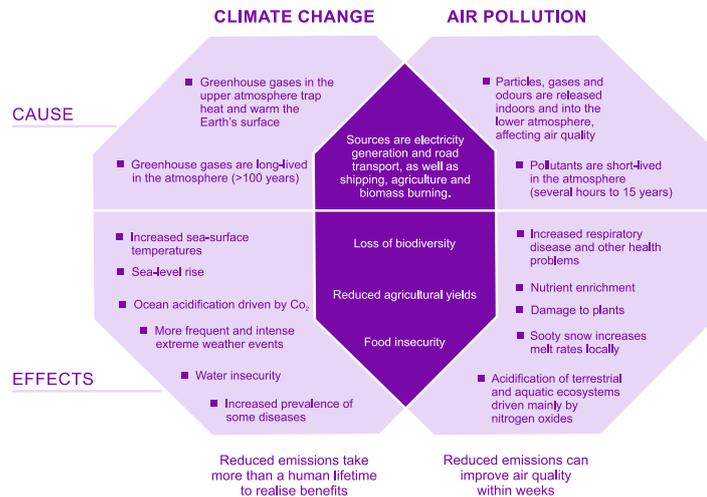


Figure 1: Comparing climate change and air pollution

Connecting climate change and air pollution

Climate change affects air quality as increases in average temperatures increase the frequency of summer smog.

Air pollutants can have either a positive or negative effect on climate change. Black carbon, for example, is a major contributor to climate change as it absorbs heat and may speed up the melting of glaciers and alter weather patterns. Meanwhile, sulphur dioxide, despite being bad for human health and the environment, has a 'cooling' effect when it reacts with other gases in the atmosphere.

Human health and air pollution

Short-lived climate pollutants (SLCPs) and other air pollutants have direct consequences on human health. In 2012, the World Health Organization (WHO) attributed over 7 million deaths to household air pollution and ambient air pollution, with nearly one-quarter of these deaths occurring in South Asia (1.72 million).¹ Most air-pollution related deaths are due to cardiovascular disease, stroke, pulmonary disease, lung cancer and acute respiratory infections in children.

The air pollutants of greatest concern in South Asia include:²

- Particulate matter (PM) – fine particles in the air, such as black carbon, which is formed from the incomplete combustion of biomass and fossil fuels
- Methane, which is produced by burning fossil fuels and through agricultural and waste treatment activities
- Sulphur oxides, the sources of which vary from country to country, but include petroleum refineries, pulp and paper industries, and vehicles

¹ Data extracted from the WHO Global Health Observatory Data Repository for India, Pakistan, Bangladesh, Sri Lanka and Nepal.

² Khwaja et al. (2012).

Climate change and air pollution tend to be addressed independently; the former focusing on reductions in CO₂ within the international and national arena and the latter focusing on actions to improve air quality locally. Yet, developing integrated strategies that target both of these issues could have benefits for human health, ecosystems and the climate, while reducing associated administrative and implementation costs. This briefing examines the benefits and challenges associated with tackling these two issues together.

About the series

The ACT on knowledge series focuses on key emerging issues related to climate change and how they affect South Asia. Each leaflet synthesises existing knowledge on a topic and aims to stimulate discussion. Suggestions for further reading are provided at the end. Please see the full list of topics at www.actiononclimate.today

- Nitrogen oxides, which are mainly emitted during energy consumption, but also through road traffic and industries such as fertiliser manufacturing
- Hydrofluorocarbons (HFCs) – manufactured compounds used as refrigerants – damage the protective ozone in the upper atmosphere. These could become more significant pollutants as global warming creates an increased demand for cooling systems.

“ The deaths attributable to air pollution could increase with climate change as summer smog becomes more frequent in a warmer climate. ”

Box 1. The dangers of air pollution in India

The problem:

Air pollution, both indoor and outdoor, is significantly impacting on the health of India's citizens as well as its economy. Of the world's 20 most air-polluted cities, 13 are in India; annual average PM levels in Delhi exceed WHO safe limits by over 600%, which could be reducing the life expectancy of Delhi's population.

The sources:

- Over 60% of India's power generation comes from coal-fired thermal power plants, which release sulphur oxides and nitrogen oxides
- The number of cars are increasing on India's roads – Delhi adds 1400 cars to its roads daily – and emissions and fuel standards are low
- 87% of rural households and 26% of urban households burn biomass for cooking, which is the leading cause of indoor air pollution
- 30% of rural households use kerosene fuel in their lanterns, which is a primary source of black carbon.

The impacts:

- Outdoor air pollution was the fifth leading cause of death in India, killing 620,000 people in 2010, a 620% increase over estimates for 2000
- Air pollutants were attributed to a 36% decrease in wheat yield and a 20% decrease in rice yield between 1980 and 2010
- The World Bank estimates that the annual cost of air pollution amounts to 3% of India's GDP; a 30% reduction in just PM emissions by 2030, could save the country US\$105 billion in health-related costs.³

Human health and climate change

South Asians are particularly vulnerable to the effects of climate change. Impacts on their health may include:

- Reduced food availability as a consequence of a decline in crop yields of up to 30%⁴
- Increased hazard risk (such as flooding, fires and landslides) due to more extreme and more frequent weather events
- Increased prevalence of food-borne, water-borne and animal-borne diseases.

Benefits and challenges of an integrated approach

Despite the links between climate change and air pollution, separate policies have evolved to manage these issues. Responsibility for these issues falls to different levels of government and they are generally discussed within different forums. Yet, there are numerous advantages to shifting towards an integrated approach that would realise the short-term benefits of improved air quality while also meeting longer-term climate goals.

The benefits of an integrated approach

- **People care about local air pollution.** People engage with issues that affect their local environment and their personal health. Air pollution affects all sections of society, which can generate the political will to address air pollution with the added benefit of mitigating climate change
- **There are economic advantages to an integrated approach.** As many activities contribute to both climate change and air pollution, there are financial benefits associated with making gains in both issues through connected actions. Abatement of specific pollutants that contribute to both problems, such as black carbon, is a win-win situation. The costs associated with mitigating greenhouse gases are offset by savings in pollution control measures as well as achieving the ancillary

benefits of reduced air pollution. Assessments for Europe and parts of Asia suggest that a 20% decrease in CO₂ emissions, for example, could lead to a 15% fall in air-pollution related deaths and their associated healthcare costs⁵

- **Quick-wins in air pollution can make long-term gains in climate change.** Reducing emissions of SLCPs will lead to improvements in the atmospheric concentrations of these pollutants that can certainly be measured within a human lifetime and even within a political cycle. For example, reducing methane would reduce ground-level ozone, which would have human health benefits and improve agricultural yields, while also mitigating global warming. In the upper atmosphere, ozone protects the Earth from the sun's radiation. However, in the lower atmosphere, it is a potent greenhouse gas and harmful air pollutant
- **Climate change affects air quality.** Ozone smog forms when air pollution reacts with sunlight and heat. Increases in average temperature as a result of climate change speed up the process and result in an increased frequency of summer smog.

The challenges

The relationship between climate change and air pollution is complex. Some air pollutants are masking an estimated 40% of the warming that is occurring due to greenhouse gases already in the atmosphere.⁷ Reducing air pollutants, such as sulphur oxides, will remove this masking effect and accelerate global warming. Trade-offs are also not straightforward; while connecting households to the power grid reduces indoor air pollution, renewables cannot yet meet energy demands, so emissions from coal fired stations increase. These issues must therefore be tackled using an integrated approach.

Recommendations

- Where separate policies exist to address issues of climate change and air pollution, efforts should be made to strengthen linkages between these policies
- Policy choices should be examined for their benefit to climate change as well as their benefit to air pollution. Renewable energy, for example, is good for climate change as well as air pollution
- A detailed analysis of the interactions related to any policy is required. For example, filters that remove PM from the exhaust of diesel engines can help improve air quality, though they have little or no impact on climate change. While biomass as a fuel is better for climate change than burning fossil fuels, it is bad for air quality⁸
- Co-benefit strategies should be developed at both the local and national levels, but international negotiations should also consider the synergies and trade-offs between these two globally important issues.

“ Air pollution could exacerbate these impacts by contributing to near-term climate change. ”



⁵ Global Atmospheric Pollution Forum (17–19 September 2008).

⁶ Lehner (2014).

⁷ Kuylenstierna and Hicks (2008).

⁸ Department for Environment, Food and Rural Affairs (Defra) (2010). Examples extracted from Table 2 and Figure 6 for illustrative purposes.

Box 2. Changes in China have doubled the benefits⁶

China's goal to clean up its air quality is also helping curtail climate change. Recent legal and policy changes have introduced more transparency, meaningful fines for polluters and a new national action plan for air pollution that is turning away from coal-based energy and focusing on a cleaner future. Some of the actions China has taken include:

- Introducing national air quality standards that trigger actions, such as halving the number of cars on roads and stopping factory production and construction when air pollution reaches a certain threshold
- Introducing daily fines for polluting that accumulate until the pollution stops, which are a bigger deterrent than a one-time fine.

KEY MESSAGES

- Climate change and air pollution are often approached with separate strategies as it can be unclear how these issues are related. There is growing awareness that the synergies between climate change and air pollution are an opportunity to take actions to address both. It is possible to make immediate gains in reducing air pollution – which is politically attractive – with co-benefits of climate mitigation
- But, recognise that there are trade-offs in that reductions in 'climate cooling' air pollutants will accelerate global warming
- Therefore, national and international level strategies and policies need to be assessed from both perspectives.

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