



CLEARING THE FOG: TACKLING PAKISTAN'S SMOG CRISIS

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Summary

The persistent smog in Pakistan, particularly in urban centres, is posing a **serious health risk** to the population. The use of **fossil fuels** to meet energy requirements and the **burning of waste and crops** emit smog-causing pollutants in the air. **Administrative and bureaucratic lags** from both federal and provincial governments, along with **costly measures** for transition to eco-friendly fuel, have impeded air quality management efforts. To effectively tackle the smog crisis, a mixture of short and long-term policies are required:

1. **Removing taxes from renewable energy sources** (e.g., solar power systems) while **imposing taxes on non-renewable energy sources** (e.g., diesel generators) for domestic and commercial consumption.
2. **Limiting the use of private transport** by extending public transport networks and commercial centres, and **transitioning to eco-friendly fuel** to limit the emission of smog-causing pollutants from vehicle exhausts.
3. **Providing subsidies and cash incentives to farmers** for adopting eco-friendly farming practices and **working with international partners** to develop an eco-friendly waste disposal system.

Introduction

In 2022, Pakistan was ranked third among countries with the worst air quality, with Lahore topping the chart as the most unbreathable city (Al-Jazeera, 2023). About 128,000 people die annually from illnesses caused by air pollution (Junaidi, 2022). Furthermore, the country loses about 5.88% of its GDP (\$47.8 billion) due to the economic stress on the healthcare system caused by air pollution (Rafique et al., 2022). Despite these alarming statistics, the government has failed to achieve any progress in improving air quality.

To effectively control smog, a comprehensive strategy combining intermediate and long-term policies is essential. Key actions should involve reducing dependence on fossil fuels, elevating public transportation systems, and developing eco-friendly practices for stubble burning and waste management. These approaches ensure a balanced focus on urgent measures and sustainable solutions.

Background

In Pakistan, the predominant causes of smog are nitrogen and sulphur dioxides, along with fine particulate matter (PM2.5) (particles that are 2.5 microns or less in diameter) (Habib, Nasim, & Shahab, 2021). The main sources of these pollutants include poor-quality fuels such as coal, crude oil, and high-sulphur diesel used in vehicular and industrial emissions, as well as waste and stubble burning (Aslam, 2023).

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The limited and unreliable public transport system forces people to acquire personal modes of transportation. In the past 20 years, public transport has increased by 165%, whereas private transport has increased by 332%, increasing the demand for petrol and diesel and resulting in greater pollutant

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content in the air (Asif, 2019). In 2020, the pollution from personal vehicles accounted for 43% of the total pollution (FAO, 2020). The industrial sector, accounting for 27% of the GDP, contributes 25% to pollution, largely due to the use of poor-quality fuel and inadequate machinery maintenance (FAO, 2020; Khan et al., 2014). Daily burning of 47,920 tonnes of waste without proper disposal systems emits PM2.5 and toxins (Environmental Protection Agency, 2005). Moreover, the agriculture sector, predominant in Punjab (19% of the GDP), adds 20% to pollution through crop and stubble burning (Agriculture Department, n.d.; FAO, 2020). This practice exacerbates smog in winter as pollutants are trapped and suspended in the cool, denser air (Habib, Nasim, & Shahab, 2021).

In 2022, Pakistan recorded a PM2.5 level of 97.4 $\mu\text{g}/\text{m}^3$, well above the safe limit of 25 $\mu\text{g}/\text{m}^3$ (Kaushik, 2023). This persistent hazardous air quality heightens the risk of premature mortality and morbidity and increases the likelihood of cardiovascular and respiratory diseases (Mari, 2021). An average Pakistani loses 2.7 years of their life, while an average Lahori loses 5.3 years of their life (Habib, Nasim, & Shahab, 2021). Additionally, crop burning reduces soil fertility by 25-30%, impacting agriculture output (Shaikh, 2022). Where legislation is well-formulated, execution



in practice is difficult. A disconnect between federal and provincial levels and administrative and bureaucratic delays impede air quality improvement efforts (Khan et al., 2014).

Policy recommendations

To mitigate the smog crisis in Pakistan, both small and large-scale actions need to be taken regarding industrial and vehicular emissions, as well as waste and stubble burning. Short- and long-term proposals are thus proposed and examined.

1. Industrial emissions: Shift from non-renewable to renewable and eco-friendly energy.

Short-term and small-scale:

The import and sale of renewable energy equipment, including solar power systems, is taxed with a 17% sales tax and an additional 3-5% customs duty tax, placing them **beyond the financial reach of even the upper-middle-class population** (Siddiqui, 2022). Reverting to the previous 0% tax policy for renewable energy sources, while increasing sales tax to the standard 17% on diesel generators is necessary. This will incentivise the public to opt for eco-friendly alternatives for commercial and domestic energy usage amidst frequent electricity outages in Pakistan.

Additionally, **air monitoring units could be installed** in industrial areas to assess industry emission levels, particularly in smog-prone urban cities. Specific monitoring units as part of the smog-control initiative of the Environment Protection Department (EPD) could be tasked with the responsibility to work in liaison with the police and the judiciary **to ensure industries keep their emissions to a minimum** by installing air cleaning devices and upgrading machinery and equipment, with offenders held accountable. Lowering the emission of pollutants in urban centres also lowers the health risks to the dense city

population, thereby limiting the economic stress on the healthcare system.

Long-term and large-scale:

Pakistan currently meets about 60% of its energy needs from fossil fuels and 30% from **green and renewable energy sources**, which **could be increased by 30%** by 2030. This would decrease Pakistan's dependency on using and importing non-renewable energy (International Trade Administration, 2022). Such elimination of sources of smog-causing pollutants would significantly **improve air quality** but require **costly restructuring of the power and industrial infrastructure** to facilitate the transition to renewables.

2. Vehicular emissions

a) Encourage the use of eco-friendly fuel

Short-term and small-scale:

Specific **monitoring units**, as part of the smog-control initiative of the EPD, could be tasked with the responsibility to work in liaison with the **police and the judiciary to prevent oil refineries from adulterating petrol** and ensuring it meets regulatory standards and **hold the offenders accountable** (Jamal, 2019). This would limit the emission of smog-causing pollutants like sulphur dioxide and nitrogen oxides from vehicular emissions.

Long-term and large-scale:

While the short-term approach provides temporary respite to ensure that the currently available fuel is not further contaminated, there is still a **pressing need to switch to an overall eco-friendly alternative**. Therefore, provincial governments must coordinate with local **oil refineries to upgrade their facilities** to support eco-friendly fuel processing and supply, and work with the federal government to increase imports of eco-friendly fuel with low sulphur content (Ali, 2019). These

measures will require **considerable cost** and administrative procedures in terms of negotiating with new suppliers and upgrading oil refineries' facilities to ensure that they are able to refine and supply the new fuel. This is likely to be completed over a long-term period due to **bureaucratic delays** and **budget constraints**.

b) Promote the use of public transportation

Short-term and small-scale:

Implement **higher taxes for diesel cars**; **restrict multiple car ownerships** per household by denying registration of second cars to household addresses for which a car is already issued; **mandate installation of catalytic converters** upon purchase or repair; encourage **car-pooling** in workspaces; **pedestrianise busy commercial centres** in major cities to encourage cycling or walking instead of reliance on cars. Lowering the risk of emission of smog-causing pollutants also lowers the health risks it poses for the dense population of urban cities.

Long-term and large-scale:

The existing transport system is limited and unable to cater to metropolises such as Lahore and Karachi. Hence, a significantly greater population is exposed to the harmful health impacts of smog, resulting in a greater strain on the healthcare system. The **train and bus networks must be expanded** and integrated well with the city. Ensuring reliance on public transportation with regular quality maintenance of transport vehicles and low and affordable fares, and promoting eco-friendly practices, such as cycling, would reduce the need for personal car ownership. Consequently, this would help decrease vehicular density and emissions, which are major contributors to smog.

3. Waste and stubble burning: Eliminate waste and stubble burning by encouraging alternative solutions.

Short-term and small-scale:

Educate farmers on the environmental, health, and soil quality impacts of stubble burning; **provide subsidies and cash incentives** to farmers for adopting **eco-friendly farming practices** such as purchasing stubble removal equipment; boost bioenergy demand to provide alternative uses of crop residues, thus mitigating the need for crop burning.

Long-term and large-scale:

Collaborate with international and local partners to **develop a country-wide eco-friendly waste disposal and management method**. Subsequently, this will help minimise emissions from crop burning and insufficient waste processing while promoting sustainable practices that contribute to air quality improvement in Pakistan overall.

Conclusion

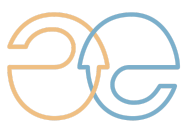
A more robust coordination between federal and provincial governments and intergovernmental bodies is required to address bureaucratic deficiencies and impact policy implementation. A rapid response and engagement from the judiciary are also necessary to hold accountable those who evade laws and regulations. Given Pakistan's economic constraints, the proposed long-term and large-scale solutions are cost-intensive and may be challenging to implement. This requires considerable effort in terms of cost planning, budget allocation, and revenue generation by the government. Therefore, short-term, albeit small-scale, solutions could be prioritised to have some immediate relief from smog to ease the burden and economic stress on the healthcare system.



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