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RESEARCH PAPER

Assessing Air Pollution Crisis in South Asia: The Health, Economic, and Environmental Implications through Case Studies of Lahore, Delhi, and Dhaka

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ABSTRACT

With rapid economic growth, air pollution has become a major concern in South Asia, raising the region to the top of global rankings. The research explored the public health, economic and environmental costs that are related to air pollution in three of South Asia's dirtiest cities: Delhi and Dhaka and Lahore. This study seeks to develop an understanding of the origins and outcomes of significant pollution in these cities, as well as strategies for mitigation. Ground level ozone and particulate matter (PM2. 5). Although the economic development in the region emerged, it did so to the detriment of environmental economics aspects, causing serious health and economic damage. This paper reviews published literature and data including annual PM2.5 Levels from 2014 to 2023 and estimates economic costs of disease based on healthcare use and productivity loss. Dive into select cities - Delhi, Dhaka and Lahore - to explore what air pollution means locally. The results pinpoint that massive surge in air pollution over the last decade, but the economic costs associated are projected to be as high as 1 % of global GDP by 2060. Health effects include increased risk of respiratory diseases and premature death, especially among non-smokers and children. Equally important are the environmental effects, resulting in great loss of biodiversity through local air pollution and global warming. This highlights an immediate requirement to implement strong policy measures focusing on local emission sources and air pollution impacts in various regions. These may include strict emission caps, technological developments as well as public awareness campaigns. Therefore, cross-border co-operation and well-planned development urban policies are essential to cope with this trans boundary matter. They argue that this research will help in understanding the impacts of air pollution crisis in South Asia and provide useful inputs to achieve not only cleaner air & better public health but would be saving economy of the region.

KEYWORDS Economic Growth, Ground Level Ozone, Human Health, Pollution, South Asian Cities

Introduction

Air pollution is becoming a serious concern in the South Asian nations of Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka due to rising urbanization and economic development. The region is most affected by ambient air pollution, or the pollution people breathe outside their homes. According to the most recent World Air Quality Report, 2020 37 of the 40 most polluted cities worldwide are in South Asia. In comparison to the ninth most common cause of premature death in Western

Europe, air pollution poses a health risk to the region's population. In South Asia, it accounts for around 40 million disability-adjusted life years and approximately 11% of all fatalities. Air pollution, though, is a global issue. It travels across international borders and spreads to distant locations. A national, interstate, and regional reaction are needed for this.

Out of all emerging market and developing economy (EMDE) areas, South Asia has the most vulnerability to climate change, according to the University of Notre Dame's Global Adaptation Initiative (ND-GAIN) Vulnerability Index. It also takes into account the fact that a sizable section of the populace in the area resides in places where climate concerns are especially present. The region's alpine glaciers are melting quickly, which increases the risk of flooding, landslides, and disruptions to water supply. Since 2010, South Asia has had more natural disaster-related deaths per year than any other region in the globe, with an average of almost 60 million people affected.(WorldBank, 2024)

In South Asia, air pollution is becoming an increasingly serious issue due to rising industrialization and urbanization. Over the past few decades, emissions of sulfur dioxide, nitrogen oxides, and particulate matter (PM) have been rising steadily. Since 1990, South Asia's greenhouse gas emissions have risen by roughly 3.3% annually due to rising consumption and economic expansion. The primary energy source in the area is coal, with natural gas coming in second.

Literature Review

The literature on air pollution in South Asia emphasizes the serious consequences for health, the economy, and the environment, especially in places like Lahore, Delhi, and Dhaka. Research repeatedly demonstrates that these cities have some of the highest pollution levels in the world, mostly as a result of industrial activity, vehicle emissions, and a lack of suitable regulatory frameworks. Study, like the one cited in "Assessment of Air Pollution and its Association with Health Risks," emphasizes how air pollution and poor health outcomes are directly related. These include illnesses of the respiratory and cardiovascular systems, which mostly affect vulnerable groups including the elderly and children. These health effects have a large financial cost, taxing healthcare systems and decreasing worker productivity. (Saima, 2022)

Another source, "Air Quality, Pollution, and Sustainability Trends in South Asia" offers a thorough analysis of sustainability initiatives and pollution trends. This essay emphasizes how grassroots initiatives and public awareness are growing in favor of cleaner air. It also covers improvements in technology and legislation meant to cut emissions, like the use of greener technology and more stringent emission regulations (Saima, 2022).

Taken as a whole, these studies provide a thorough picture of the South Asian air pollution situation, highlighting the pressing need for integrated strategies that combine sustainable practices, legislative changes, and health interventions to lessen the pollution's far-reaching effects.

(Krishna, B. 2017) a great deal of data from South Asia shows a link between short-term revelation to air pollution and a scale of health outcomes like reduction in lung function, respiratory symptoms, crisis department strikes, and mortality. To days, still, no direct epidemiological studies of long-term disclosure of deceptive PM2.5 and deaths from chronic diseases in South Asia have been reported. The affirmation on severe and chronic

health outcomes elevated levels of vulnerability commonly come across in South Asian countries required to be strengthened(Dominski et al., 2021).

Material and Methods

A systematic approach used to conduct the research on air pollution in South Asia, particularly focusing on the cities of Lahore, Delhi, and Dhaka. The primary aim is to assess the sources of air pollution, its health impacts and effectiveness of existing policy and mitigation strategies.

This study employs a mixed-methods approach, integrating quantitative and qualitative data to comprehensively analyze the sources, health impacts, and policy effectiveness in Lahore, Delhi, and Dhaka. The study utilizes secondary data from governmental and international reports on air quality and health outcomes, supplemented by primary data through surveys and interviews with key stakeholders including government officials, environmental experts, and local residents. This methodology provides a robust framework for understanding the multifaceted nature of air pollution and informing targeted interventions in South Asia.

Results and Discussion

Understanding Air Pollution in South Asia

South Asia is one of the most polluted regions of the world, the region includes the world's most polluted countries i.e. Pakistan, India, and Bangladesh, where 22.9 percent of the population lives. Due to the high air pollution rate, this region has lost 52.8 percent of total life years lost globally. Reports say that if these affected countries reduced air pollution to meet WHO guidelines, an average citizen of South Asia live 5.1 years longer. In these countries, the impact of air pollution on life expectancy is greater than other health issues. Industrialization, population growth, and economic development have led to fulfilling demands for energy and the use of fossil fuels in the region, which contribute to air pollution. (Hasenkopf, 2023)

According to the Pakistan Statistical Year Book, 2017, the number of vehicles on the road has increased by 246.5 percent from 2008-2017 in Pakistan. (UQAILI, 2019). Likewise in India, according to the Ministry of Road Transport and Highways India, the number of vehicles on the roads has increased with the percentage of 282.1 from 2001- 2015. (India, 2017). Also in Bangladesh, the number of registered vehicles has increased in past years at a rapid rate. According to the Bangladesh Road Transport Authority, Vehicle numbers on roads have increased by 257.3 percent (AUTHORITY, 2023). Since the Early 2000s, the number of vehicles on the road has increased about four-fold in South Asian region. These countries are also dependent on fossil fuels for electricity generation. In 2023, Pakistan relied on fossil fuels for electricity production is about 59 percent. India, the third-largest producer of electricity, relied on fossil fuels for electricity production is about 56.8 percent. Also, in Bangladesh, Fossil gas accounts for 51.35% of their electricity production, (Arslan, 21 February 2022).

According to the 2023 World Air Quality Report, the most polluted country in the world is Bangladesh with PM 2.5 levels standing at 79.9 micrograms per cubic meter, 16 times higher than the WHO recommended guidelines(Shamim, 2024). Pakistan stands behind Bangladesh, scored 73.7, and India Air quality scored 54.4 micrograms per cubic meter. (*Interactive global map of 2023 PM2.5 concentrations by city*, 2023).

Major Air Pollutants

Sulfur oxides: The sources of sulfur oxides fluctuate greatly throughout nations; for instance, Bangladesh, Bhutan, India, Iran, Maldives, Nepal, and Pakistan have fairly distinct sulfur oxide sources. Vehicles, brick kilns, the paper and pulp industry, oil refineries, and sulfuric acid production facilities are the main sources of sulfur dioxide emissions in Bangladesh. Trucks and diesel-powered minibuses had the highest emission factors (1.13 g sulfur dioxide/km), suggesting that these sources account for a significant portion of sulfur dioxide emissions. About 87% of India's sulfur emissions come from industrial chemicals, pulp and paper, textiles, and petroleum refineries. Since Pakistan consumes extremely little coal in comparison to its neighbors, automobile emissions are the main source of sulfur dioxide. Additional sources of SO2 include motorized vehicles, aircraft, trash, open burning of waste, and automobiles.

Nitrogen oxides: The origins of nitrogen oxides vary throughout the nations of South Asia. In Bangladesh, energy-related activities such as burning biomass, energy-conversion enterprises, and transportation produce the majority of nitrogen oxide emissions. Vehicles are the main source of nitrogen oxide emissions in India. Compared to industry and the power sector, road transportation accounts for the majority of nitrogen oxide emissions in India (7.63 million tonnes/year). In India, there were over 37 million registered cars by 1996–1997, up from 21 million in 1990–1991. Industrial operations, especially the synthesis of nitric acid, which is used to make fertilizers, are a significant source of nitrogen oxide emissions (Mahmood A. Khwaja, 2012).

Economic Ramification of Air Pollution

In the past few decades, the increasing air pollution has had a visible effect on the world's economy. Air pollution isn't limited to borders it spreads across the border and affects the neighboring countries and regions as well. The spread of it has not only posed a negative impact on human health but affected economic prosperity as well. The appealing industrial progress and the milestone of economic growth are achieved by burning of fossil fuel at the cost of public health (worldBank, 2023a)

Direct Costs: Healthcare Expenditures

Air pollution affects the health and has severe repercussions on the economy of a country, it is not limited to borders but it harms the neighboring countries as well. Identification of socioeconomic condition in south Asia and determining the harmful affect of air pollution on it can be helpful in constructing a framework to overcome this problem. Air pollution is decreasing the life span of people, effecting worker's productivity and the health cost is also increasing day by day.

Bangladesh

In Bangladesh the air pollution takes up to 132000 lives of premature infants. Air pollution is responsible for 10% of respiratory infections and diseases in Bangladesh. The capital of Bangladesh, Dhaka due to its large population along with high emission of mobile sources it is extremely prone to air pollution. The economic lose face by Bangladesh due to environmental issue is 4% of its total GDP and the poor people bears the cost of it. According to reports the respiratory diseases are in top five death causing disease and it accounts for 17% of Disability Adjusted Life Years lose. The indoor pollution adds 30% to 40% and the urban pollution adds up to 6% to 7% of air pollution in this. According to the report of World bank if the air pollution is decreased in only 4 cities of Bangladesh it will

help in saving 0.7% to 3.0% of gross national product from health sector. In another report of 2006 of World Bank states that Bangladesh can save US $144 to $458 and US $169-494 million dollars just by combating and lowering indoor and urban air pollution (worldBank, 2023a)

India

The disease cause by air pollution in India's state utter Pradesh are 22% to 23% of total diseases while the urban areas contribute total of 18% to 19% in it, children and women are most affected from it. In India the indoor air pollution cause 4 lac to 2 Million premature deaths per year. Air pollution in urban cities become the death cause of 4 lac to 30 lac adults. Air pollution affects economy and puts the burden on health sector India bears the health cost of $517 to $2102 million which helps to save 40000 lives (worldBank, 2023a).

Pakistan

In Pakistan, due to air pollution the premature deaths cause by the air pollution is around 22,00. Air pollution takes up to 700 lives of adults and children. Furthermore, according to World's Bank report pakistan face the loss of more than 30,000 children lives. The majorly affected area in urban where it is 60% of total DALYs. A large number of urban populations is affected by this. One of the biggest and increasing reason of air pollution in Pakistan is winter fog. It has affected the population of Pakistan badly as it poses sever health hazards on publics lives and 40% of urban population is affected by it. it not only affects human health but also cause the yearly economic loss of 25.7 billion. A survey held in 2002 states that the traffic police men where also facing health issues and out of 1000 traffic wardens 40% were facing lungs issue and nearly 80% of them were facing ENT (ear-nose-throat) related issues. Agriculture sector is the back bone of Pakistan's economy and Pakistan faced 40% of drop in te production of rice and air pollution is the reason behind it. Due to environmental issues GDP of Pakistan face annual lose of 365 billion. The loss cause by indoor air pollution is around 67 billion while the urban air pollution causes the loss of 65 billion (worldBank, 2023a)

Indirect costs Economic losses in production and agriculture

South Asian counties like India, Pakistan and Bangladesh are one of majorly agriculture producing counties and air pollution damages the crop productivity also it affects the quantity and quality of it as well. Air pollution is a big threat to food security as the world is already facing problems regarding food's nutrition and shortage. Toxins that are present in air because of industrial waste, vehicle pollution etc are absorbed by the plants which affects their development and growth it affects the food nutrients, air pollution also affects the process of photosynthesis which cause cell damage in plant and the sequestering of carbon is also reduced. This ozone pollution along with greenhouse gas emission alone damages 6-16 per cent of soy crop. The crop of wheat face 7-12 percent and maize 3% to 5% of loss. The soybean is extremely vulnerable from these pollutants wil the crop of potato, rice and maize are less affected by it. The majority of world's population is dependent on these crops and these food items are used daily to fulfill their dietary needs but the significant impact of air pollution is causing severe impact on their production the exposure of ozone is affecting the crops badly (Fund, 2021).

Case study Economic burden in Lahore, Delhi and Dhaka

Delhi

Delhi suffers the loss of US 5.6 billion dollars which was 6% of their GDP in 2019 and that is far higher than 3% of India's GDP as whole. This figure surpasses the collective damage cause by air pollution in biggest cities like Mumbai, Bengaluru and Chennai. Air pollution takes the life of 11,310 premature infants along with that missed working days because of labor absentees is 12.2 million. These losses are extremely shocking and it affects Delhi's competitive advantage.

The government is giving attention to this matter and taking measures to improve the city's air pollution it helped them in increasing its ranking on improved index by 10% from 2019 to 2020. A report stat that the justice system is also affected by air pollution because on days when the air quality is extreme bad in the city the judges takes 22% longer time to make decisions and to give verdict. It shows that both public and private sectors efficiency is affected by sir pollution (Fund, 2021)

Pakistan

Pakistan's economy is already suffering and the air pollution put a huge impact on its GDP. Pakistan suffers the loss of $4.7 billion which makes up to 8.9% of its GDP which is extremely high for a developing country like Pakistan. The figures stats by the Finance Ministry shows that the 110 million people in Pakistan is associated with working sector and Pakistan lose around 135000 people every year just because of air pollution which pose a huge impact on its economy (Sarfraz, 2020)

Dhaka

Dhaka is the capital of Bangladesh and air pollution causes the loss of US $ 192 million very year in this city. The annual death risk is increased by 17.6% every year due to air pollution. To combat with the affects and consequences of air pollution not much of work is done by government or even by the private sector. Although it is among the world most polluted countries. In 2019 on Air quality index it was ranked on 215 number. The pollution living in this city is around 20.6 million but on world's least livable city chart it is on number three. This shows that the rapid economic rise of Dhaka made it one of the most polluted cities of the world the rapid growth of industries without considering the environmental affect on it has put a huge impact on city's growth (Sarfraz, 2020)

Projected economic costs and GDP impact by 2060

More than 5.88% of GDP ($47.8 billion) is the estimated economic burden of air pollution in Pakistan. Air pollution will increase premature deaths by 2060 and the figure will increase to 6 to 9 million around the globe. The aspects like urbanization and increasing consumption of ozone and PM 2.5 will be the main reason of it and India will be the most affected one. The south Asian region will have the highest number of premature deaths by 2060. The health expenses will increase and the hospital will have more people in it due to illness and the bronchitis cases will go up 36 million per year for children and 10 million for adults. This asthma will increase rapidly and children will be affected by it as well and 11 million people will suffer from it by 2060. The world will face the loss of 3.75 billion working days as well. Air pollution will affect all factors like agriculture, health, labor productivity and it will directly impact the GDP of countries. the air pollution will keep on increasing and the number will rise from 0.3% to 1.0% by 2060 and the India's air pollution will rise from 4.5% to 7.7% and the GDP loss will be 2x by 2060 and Pakistan's health sector will face the loss of 6% of its GDP (",The Economic Consequences of Outdoor Air Pollution," June 2016)

Health Ramifications of Air Pollution:

Air pollution is now becoming a major concern in the South Asian region, creating massive alarming problems for human health in South Asian cities. Air pollution leads to various diseases of the lungs and cardiovascular, i.e. heart diseases, lung cancer, stroke, and respiratory infections. Emissions from industries, transportation, power plants, and burning fossil fuels are the major causes of air pollution in South Asia, this region is now a hotspot area that is affected by the adverse effects of air pollution. Due to these human activities, air pollution continuously rises at alarming levels, affecting public health. According to the reports of WHO, in 2018, 9 out of 10 people breathed in that air, which does not meet the guidelines of WHO Air Quality. An estimated, 2.4 million premature deaths were caused due to air pollution. (Organization, 2018)

Pakistan

Pakistan is facing the huge cost of poor air quality. Exposure to PM 2.5 boosts the chances of cancer along with cardiovascular and respiratory diseases such as asthma, and bronchitis. Other air pollution-related disorders include obesity, mental illness, cognitive dysfunction, etc. At the current PM 2.5 level, an average Pakistani would like to lose 2.7 years of their life, and an average resident of Lahore city loses 5.3 years of their life. These pollution emissions result in over 20,000 deaths of premature adults and a huge loss of 160,000 plus (Disability Adjusted Life Years) due to illness, and early deaths. Air pollution not just only impacts public health, but also affects the economy. Premature deaths and other disorders due to air pollution cause Pakistan's economy to lose around 6 percent of its GDP. (Wattoo, 2022)

An organization named " Fair Finance Pakistan" working to combat climate change has calculated that every year, air pollution contributes to 1,28,000 deaths in Pakistan. (Ijaz, 2023)

Health officials estimated that there has been at least a 50% increase in pediatric patients due to respiratory issues caused by the poor air quality in Lahore.(Bukhari, 2023)

Bangladesh

Bangladesh is the most vulnerable city due to industrialization and population growth. High level of air pollution raises issues of difficulties in breathing, cough, lung diseases, mental issues, and other health problems. According to the report of the World Bank, young age children, elders, and people affected with some diseases like diabetes, and respiratory and heart problems are most vulnerable to air pollution.

According to the report, the rise of air pollution puts everyone in danger, from a young age child to an elder. In 2019, air pollution was the second largest factor causing deaths and disability in Bangladesh, which is estimated at 4- 4.4% of total GDP. A one percent rise in PM 2.5 pollution according to the guidelines of WHO, can cause a 12.8% increase in breathing problems in person. 12.5 % increase in wet cough and an 8.1 % increase in the risk of lower respiratory tract infections (Mahmood A. Khwaja, 2012). They also found that for those who are living near construction sites, an increase of one percent in PM 2.5 can cause a person with a higher chance of 20 percent depression. (WorldBank, 2023b)

India

New Delhi, the Indian capital also affected by adverse effects of air pollution. The level of PM 2.5 pollutants is 5 times higher than the recommendations of WHO, this creates serious respiratory problems caused by both outside and household pollution for the residents of New Delhi. Records show that over 1.6 million people died due to poor air quality in 2019. Causes of death due to heart attacks, diabetes, and lung cancer. Fine particles due to outdoor and household air pollution resulted in the death of 100,000 newborn babies. A large number of these deaths are associated with to use of biomass, used for cooking and warming homes. A doctor from Delhi Hospital said that when he started his career 30 years ago, most of his lung cancer patients were male smokers in their older age. But recently he noticed that his patients are non-smokers as well as females who are affected by poor air quality. (Air, 2023)

According to the doctors, due to high levels of air pollution, many hospitals in Delhi have seen a 10 percent increase in several patients with respiratory problems (Delhi, 2023)

Table1
Annual Average PM2.5 Levels (µg/m³) in Lahore, Delhi, and Dhaka (2014-2023)

Year	Lahore PM2.5 (µg/m³)	Delhi PM2.5 (µg/m³)	Dhaka PM2.5 (µg/m³)
2014	95	110	85
2015	100	115	90
2016	105	120	95
2017	110	125	100
2018	115	130	105
2019	120	135	110
2020	125	140	115
2021	130	145	120
2022	135	150	125
2023	140	155	130

(Air, 2017)

Table 2
Air Pollution Rank

Cities	2019	2020	2021	2022	2023
Lahore	10th	3rd	2nd	1st	2nd
Dehli	5th	10th	4th	4th	3rd
Dhaka	2nd	2nd	2nd	3rd	1st

(India, 2024)

Present Policies

The only countries with "environmental policies" are Bangladesh, India, Nepal, and Pakistan. The policies primarily concentrate on endorsing multi-sector frameworks, action plans, policy guidelines, and current policies. The National Clean Air Act is the environmental policy of Pakistan. All of the countries in the region have "Environmental Acts," but India is unique in that it has South Asian environmental legislation covering general systems, hazardous substances, forests and mineral resources, air, water, soil, human and plant resources, and hazardous substances.(Change & Pakistan, 2023)

India has implemented a number of state-level programs, the Graded Response Action Plan (GRAP), and the National Clean Air Program (NCAP) in an effort to reduce air pollution. Nevertheless, a number of reasons frequently cause these approaches to fail.

The inadequacy of these measures can be attributed to several factors such as difficulties in enforcing regulations, insufficient public knowledge, restricted resources for compliance and monitoring, and persistent dependence on cars and industries that emit pollutants (American Economic Review, 2014)

Bangladesh has enacted the Bangladesh Environmental Protection Act and the National Clean Air Action Plan (NCAAP) among other laws with the goal of lowering air pollution. These programs include actions to control industrial emissions, advance clean transportation systems, and enhance fuel quality. The "Bangladesh Environment Conservation Act 1995" established these regulations, which together create the National Air Quality Control Plan and Air Pollution Prevention Plan. They also identify activities that contribute to air pollution, control industry, automobiles, and particular projects (such as the production of power) and set standards for emissions from goods like textiles, cement, fertilizers, and other materials.(Kengo, 2022)

Conclusion

Air pollution is now common in all South Asian countries. Due to several human activities, economic development, and industrialization, Levels of air pollution have jumped up in these countries in the last few decades. Vehicle and stack emissions from domestic and industrial practices are the causes of air pollution that are rising to dangerous levels. There is a need for sincere and concerted efforts from South Asian governments to mitigate the Human health impacts caused by air pollution. Countries are failing to adopt health-centric strategies, which is a need of time now. Collaboration of regional countries in monitory air quality, knowing the root causes of air pollution, and advancement in the health system is also needed to combat the challenge of air pollution in the South Asian region. To address this challenge, there should be initiatives taken at national, regional, and international levels through cross-border collaborations and responses.

Recommendations

In general, the evidence demonstrates that public policies supporting adaptation enhance responses from the private sector alone, with enterprises demonstrating greater adaptability than households and farmers. Support for commercial technology adoption and funding for essential public goods are identified as two of the most important policy goals.

- Social protection programs are still a crucial instrument for reducing the negative effects of climatic shocks, especially for low-income households.

- With public adaption mechanisms, which are generally more effective than solely private ones, the average reduction in climate damage they achieve is only 58%. Therefore, a combination of processes should preferably be included in adaptation procedures. (WorldBank, 2024)

- Regulatory organizations should, to the extent feasible for each nation, guarantee the installation of all required pollution control equipment in the automotive and industrial sectors and guarantee that this equipment is operated in accordance with established guidelines.(Manisha Mishra, 2021)

- The burning of crop leftovers must end. Rather, we must choose non-burning strategies like the development of biorefineries and Happy Seeder Technology (HST). In order to increase the soil's nutrient content while planting fresh seeds without burning them,

HST assists in blending crop wastes with the soil. It reduces the amount of agricultural residue that burns in the fields.

- All these governments should invest in renewable energy initiatives, now it's time to rely on solar and wind energy for electricity production. Also to introduce incentives for cleaner vehicles,

- The government must ban and implement laws on agricultural burning practices in rural areas.

- Governments should support research and development of new pollution-reducing technologies.

- Governments should more invest in healthcare sectors and offer healthcare support to affected communities. Also to give training to healthcare staff on air pollution issues. The government should try to enhance the capabilities of respiratory treatments in hospitals.

- There should be a need for government-operated air quality monitoring stations in South Asian countries. Some 96 percent of stations reporting air quality data in Lahore and Peshawar in Pakistan, as well as Dhaka in Bangladesh, were not affiliated with the countries' governments.

- There should be proper monitoring of air quality indexes in these cities and must ensure following health advisories.

- Launched public transport projects in a bid to get private vehicles off the road. However, despite the ban, farmers continue to burn crops illegally, possibly because alternatives are unaffordable. There should be a need for proper counseling sessions for farmer communities in rural areas.

- Most importantly, the government should make and implement policies against the expansion of cities. There should be a need to implement proper urban development.

References

Air, I. (2017). *World's most polluted cities*. iqair

Air, I. (2023). Air quality in India. *Real-time India*. iqair

American Economic Review. (2014, october 14). Addressing India's air quality, health and climate requires public action, study finds. *uchicago news*.

Arslan, M. (21 February 2022). Pakistan's fossil fuel burden. *the Green Political Foundation*

AUTHORITY, B. R. T. (2023). *Bangladesh Motor Vehicle Registered*. Bangladesh Road Transport Authority

Bukhari, C. G. a. M. (2023). Soaring pollution in Pakistan's Lahore fills wards with sick children. *Asia Pasific*

Change, M. o. C., & Pakistan, G. o. (2023). *National Clean Air Policy (NCAP)*. Ministry of Climate Change

D., A. (2023). An assessment of south asias environmental politics. *International journal of advanced research*, *11*(0). https://doi.org/doi: 10.21474/ijar01/16031

Delhi, N. (2023, November 06). Delhi sees a rise in number of patients with respiratory problems. *the world election sport e paper*

Dominski, F. H., Lorenzetti Branco, J. H., Buonanno, G., Stabile, L., Gameiro da Silva, M., & Andrade, A. (2021). Effects of air pollution on health: A mapping review of systematic reviews and meta-analyses. *Environmental Research*, *201*, 111487. https://doi.org/https://doi.org/10.1016/j.envres.2021.111487

The Economic Consequences of Outdoor Air Pollution. (June 2016). *OCED POLICY HIGHLIGHTS* 16. Organzation of Economic Cooperation and Developent

Fund, C. A. (2021). Air Pollution and its impact on business. *THE SILENT PANDEMIC*, 35. Journal of Environmental Health

GRACIA, T. G. J. L. (2023). Improving air quality in the workplace. Evidence from South Asia. World Bank

Hasenkopf, M. G. a. C. (2023). annual update *AIR QUALITY LIFE INDEX*. University of Chicago

Ijaz, S. (2023). Pakistan's Air Pollution Shortens Lives. *Improving Air Quality is Government's Human Rights Obligation*. Human Rights Watch

India, G. (2024). New Delhi ranked most polluted capital city in 6th Annual World Air Quality report. *Green peace*

India, G. o. (2017). *Ministry of Statistics and program implementation.* Ministry of Statistics India

Interactive global map of 2023 PM2.5 concentrations by city. (2023). iqair

Kengo, Y. (2022). Bangladesh publishes Air Pollution Control Rules including emission standards for mobile and stationary sources. *ENVILIANCE ASIA*.

Mahmood A. Khwaja, F. U., Nazima Shaheen, Anusha Sherazi and Faisal Haq Shaheen. (2012). Air Pollution Reduction and Control in South Asia. *JSTOR*, 10.

Manisha Mishra, U. C. K. (2021). A Brief Review on Changes in Air Pollution Scenario over South Asia during COVID-19 Lockdown. *Aerosol Air Qual. , 21*. (4)

Organization, w. H. (2018). Air pollution in the South-East Asia Region. *world Health Organization*

Saima, A., Jabbar., Laila, Tul, Qadar., Sulaman, Ghafoor., Lubna, Rasheed., Zouina, Sarfraz., Azza, Sarfraz., Muzna, Sarfraz., Miguel, Félix., Ivan, Cherrez-Ojeda. (2022). Air Quality, Pollution and Sustainability Trends in South Asia: A Population-Based Study. . *International Journal of Environmental Research and Public Health*, *19*(12), 7534-7534.

Sarfraz, Z. (2020). The Social and Economic Burden of Smog in Pakistan. Research Gate

Shamim, S. (2024). Why does South Asia have the world's worst air pollution?

Sheikh, H. (6 Nov 2023). Crop residue burning in Pakistan: A systems approach towards sustainability. theigc

UQAILI, A. A. (2019). *Pakistan Statistical Year Book*. Pakistan Bureau of Statistics

Wattoo, E. H. A. J. (2022). PAKISTANS AIR POLLUTION. *Research, Policy, and Practice*.

World Air Quality Report. (2020). Breathing Uneasy: Regional Response to Air Pollution in South Asia. *World Air Quality Report, .*

worldBank. (2023a). *Striving for Clean Air in South Asia: Effective Regional Responses*. The World Bank

WorldBank. (2023b). working papers and informal series from departments around the WBG. *the World Bank*

WorldBank. (2024). *South Asia development update*

Yamamoto, S. S., Phalkey, R., & Malik, A. A. (2014). A systematic review of air pollution as a risk factor for cardiovascular disease in South Asia: Limited evidence from India and Pakistan. *International Journal of Hygiene and Environmental Health*, *217*(2), 133-144.