

WORKSHOP on Air Quality

Key Takeaways

cdpr

CDPR hosted a workshop on the 1st of December 2021 which explored how air quality in Pakistan can be improved. The goal broadly was to generate a discussion on key issues of concern, formulate a research agenda around how environmental costs of low air and water quality (and the consequent health issues) increase vulnerability faced by low-income households and pushes them down the poverty ladder, and discuss how government initiatives, such as the Kamyab Pakistan Programme (KPP), that aims to improve livelihood for the poor, can be made “green” and overarching interventions that strengthen low income households’ ability to manage economic vulnerability. Participants included representatives from government and non-governmental institutions, and academic researchers. A rich conversation ensued wherein a few key recurrent themes emerged that are discussed below.

Please note that this is a working draft, and we would appreciate feedback and comments on the proposed initiatives. We also request those who are interested in working on the projects listed in the conclusion section (or similar projects) to contact the CDPR team. Thank you.

Government Initiatives, Challenges and Opportunities

Deteriorating air quality has become a perennial problem, despite the existence of detailed policies to prevent/ reduce air pollution. This was viewed by some participants as a failure by the government to implement these policies. The mandate to control/ manage the various contributors to air pollution falls under different government departments, and it has been challenging to bring them together to devise and coordinate a cohesive anti-pollution strategy. Recently,

a) Vehicular Emissions

Vehicular emissions have been identified as one of the biggest sources of pollution in urban areas. Several participants highlighted that there was a desperate need to revise the fuel standards that were set by the Environmental Protection Agency (EPA) in 2016 which put in a rough Euro 2¹ standard on fuel. The Euro 5² standard fuel is not readily available across the country. However, more than changing the type of fuel, it was stressed that priority should be given to measures that reduce the number of cars on the road at any given time. Moreover, attention was drawn to the fact that there was no check or regulation on the types of vehicles being imported, for example, vehicles were not required to have catalytic converters.

This problem warrants: i) an effective motor vehicle testing regime (perhaps through involvement of the private sector for both testing and enforcement of vehicular safety and environment standards); ii) plan to phase out old/ polluting vehicles (by offering incentives in partnership with vehicle (car/motorcycle/bus) manufacturers, banks, and regulators); iii) highlighting the financial and health costs associated with continued supply of low-quality petrol and diesel in the market; and iv) the need to have safe, reliable and environmentally efficient public transport to reduce vehicular density on the roads.

b) Industrial Emissions

Industrial emissions are another major cause of air pollution. Most industrial polluters are SMEs and do not have the capital to invest in costly environment friendly technologies. These small firms need equipment like cyclone collectors, electrostatic precipitators, bag filters and scrubbers etc. to clean their production process, but these are expensive solutions. The need for the government to provide low-interest and interest free loans to encourage the adoption of such technologies was highlighted. It was also observed that the government could play a better role as a facilitator by rewarding fully compliant firms to encourage adoption and compliance, rather than taking punitive action against them. This will require a cost benefit analysis of potential incentives to assess their feasibility.

One government initiative to control industrial emissions was the conversion of old brick kiln technology to zig-zag technology³. Zig-zag kilns produce 25 percent more bricks while using 30 percent less fuel than traditional kilns, and as a result generate 70 percent less emissions. Despite the prospective gains this conversion was not an easy feat; the Judicial Water and Environmental Commission (JWEC) had to step in and impose fines worth approximately PKR 40 million on 400 kilns across Punjab to ensure compliance. Lack of technically adept and skilled labor has been a deterrent in the adoption of zig-zag technology. To date, brick kilns continue to be categorized as cottage industry which means that they are exempt from regulations pertaining to industries, making it difficult to control them and have them adopt fewer polluting technologies. However, it is important to note that although zig-zag technology is an improvement on the traditional kilns, even this technology does not comply fully with the prescribed environment quality standards for industrial emissions. It appears then that the Government of Punjab has regulated a

technology standard when cleaner technologies exist in the market⁴.

c) Agriculture - Crop Residue Burning

Another reason for the surge in air pollution, especially during the winter months, is the burning of rice residue to clear the field for wheat sowing. Farmers resort to crop residue burning because rural-to-urban migration has led to labor shortages, making the available labor expensive to hire during rice harvesting. In the absence of skilled labor, and due to the short time span between rice harvesting and wheat sowing, farmers use suboptimal machines for harvesting rice that cut the crop mid-stalk rather than from the root. Wheat cannot be sowed if the field contains rice residue, and farmers burn this remaining stalk as it is cheaper to do so than having it manually plucked. This practice has been banned by the Government of Punjab and farmers, when identified, are fined. Although machines exist which can harvest the crop in a more efficient manner, they are expensive and remain unaffordable to the small farmers which is why they resort to using suboptimal machinery. In an attempt to remedy this, the government launched a scheme that gave farmers 80 percent subsidy (an estimated PKR 272 million) on rice crop shredders and happy seeders. The government plans to scale up this scheme to encourage greater adoption.

Implementation Gaps Identified

Most participants expressed disappointment over the fact that despite significant discourse on the issue of air pollution, practical remedial actions have been few and far between. Good policies to address the issue exist on paper that have unfortunately not been implemented in the same spirit. One example is the set of recommendations by the Clean Air Commission of 2007⁵ that aimed to address the same concerns that were being discussed in the workshop, raising serious questions on

why implementation had not taken place even after the lapse of many years. Capacity constraints in EPA and coordination discrepancies between the federal, provincial, federal, and local governments were highlighted as the primary reasons for lack of implementation. The subsections below provide more detail on challenges that limited implementation of existing policies, and where both policies and implementation need to be enhanced.

a) Lack of Ownership

The primary responsibility in terms of actions and precautionary measures lies with the government. Several participants highlighted that there appears to be a lack of seriousness on this very pertinent national issue at the highest policy levels that are responsible to set the direction. A significantly lower number of focused meetings and inability to have this on the agenda for deliberation in senior government offices was cited as examples of indifference of policymakers. Additionally, the devolution of the environment portfolio from the federal to the provincial level has resulted in a vacuum, and it appears that no one can be held accountable or put to task when instances of environmental degradation, such as the common practice of waste burning in communities, are observed. Hence, a recommendation received was the revival of local bodies and exploring the role they can potentially play in enforcement, especially given the lack of capacity and resources within the provincial departments. As discussed above, EPAs face capacity constraints and cannot address this issue solely on their own. Another suggestion received was to make the EPAs independent agencies as is the case in the United States.

The pivotal role that citizenry can play by putting pressure on the government to take

necessary action was stressed by all participants. The dire need for groups such as WWF, chambers of commerce (and their standing environmental committees), Lahore Conservation Society, Pakistan Association of Environmental Lawyers, Pakistan Association of Environmental Journalists and others to play a more active role was highlighted, not simply because this was part of their mandate, but also because these groups wielded immense power and influence that should be harnessed to further this cause.

b) Insufficient Data

There was a clear consensus on the importance and urgency for real-time, accurate, and reliable data to be able to tackle the air pollution issue. There is currently reliance on emission inventories⁶, and what is ‘visually observed’ as deterioration in air quality due to the evident smog. There is a critical need for proper source apportionment studies⁷, and having scientists and engineers on board to conduct them. Emission inventories such as the one Food and Agriculture Organization (FAO) used are based on historical weather patterns, but weather conditions have been changing with climate and, hence, these cannot be relied upon as a basis for policy or decision making. Source apportionment studies need to be conducted in tandem with emission inventories. Moreover, these studies need to be done frequently to be able to capture the effects of changing climate. Public departments need to take responsibility for their share of pollution, further highlighting the need for sectoral data as it will allow financial assistance to be given in accordance with departmental needs.

c) Faulty Emissions Standards

A senior participant emphasized that currently, regulations are not based on health

outcomes, as they should be, because if they were, regulations and emission standards would be drastically different from what we have. World Health Organization’s (WHO) standards and Burden of Disease studies can serve as a good basis to build upon. There is plenty of data about malnutrition and stunting and its links to poor water and sanitation, but it appears that the government has been unable to deal with these interrelated problems. Furthermore, it is important to conceptualize the problem correctly, so it adequately informs regulation and enforcement mechanisms. Furthermore, regulations need to be designed to be sensitive to the airshed of a geographical area; city level air pollution management strategies should vary based on pollution levels but also meteorological patterns. For example, if Lahore is prone to inversion, then the regulations for improving air quality in Lahore would be significantly different to those in Karachi which has the benefit of having sea breezes. For the same reason even cities within the same province require different emission standards, for example the regulation requirements for Lahore will differ from those set for Multan despite both being in Punjab.

d) Urban Design and Planning Challenges

Air pollution in cities needs to be viewed in the larger context of urban planning and land-use. Policy and decision making must be influenced to consider/ incorporate environmental concerns as part of the urban planning process. Pakistan requires a national green and sustainable urbanization plan that is then delegated to the provinces to implement. We observe that cities and central business districts within cities are continuing to expand and sprawl without proper zoning strategies and without keeping in mind the ecological footprint of such development. Zoning regulations should clearly separate industrial areas from residential areas and business centers should be moved into Special Economic Zones (SEZ). Currently, traffic management planning is personal-transport and car-centric with no regard for

environmental consequences. Promotion of public transportation, facilitating non-motorized transport, and imposing land use related costs for use of personal transport should be factored into urban planning.

Exploring Opportunities to make Pro-poor Government Initiatives, such as the KPP, Environmentally Sustainable to Reduce Vulnerability of Low-income Households

The poor face the effects of air pollution disproportionately because they do not have access or means to mitigate the harmful effect of continuous exposure to poor air quality. The better off do not fare any better outdoors, but indoors they have access to devices such as air purifiers, and additionally have access to the internet and information that helps guide them on how to adapt to poor air quality. Constant exposure to air pollution can have health consequences, and these are particularly severe for the low-income households - a breadwinner or a family member falling sick means the entire household falls further on the poverty ladder. The Burden of Disease⁸ report by WHO finds that in Pakistan, 70% of health issues are created by environmental factors such as air quality, water, and sanitation. Repeated incidents of environmental diseases in children under the age of two have shown to result in a reduction in IQ which impacts productivity at a national level. Environmental degradation costs the country 10% of its GDP. Hence, it is imperative that all programs designed to pull people out of poverty and transition them towards sustainable incomes should factor in ecological impacts. Policies targeting economic growth should incorporate environmental outcomes, and not be made at the expense of the environment.

Way Forward

There are various steps that need to be taken in short, medium, and long term to move towards environmentally sustainable Pakistan. A shared concern was that the environment has always been discussed by

policymakers and economists as an externality, and it was important to think about it as an asset, costs need to be assigned to the availability of clean air and water to understand trade-offs and make decisions. For this, prioritization of finances is exceedingly important as well as the need to have clear transition road maps for each sector and industry. It would be particularly useful to study the impact of donor funded projects (especially those funded through loans by the World Bank, ADB, etc.) to gauge their success/ failure in the long run and their suitability to Pakistan’s context and ground realities.

Participants discussed that the government should stop subsidizing activities which continue to pollute the environment. The focus instead needs to shift towards upgradation of technology as this is imperative to transition towards a cleaner, greener Pakistan. It was highlighted that the government receives funding under the ambit of climate change and environment, and most participants agreed it is time that this money was heavily invested in technology transfer.

Finally, it was emphasized that environmental degradation and pollution should be acknowledged as regional and perennial issues and treated as such. Collaborative efforts between different levels of government as well as between civil and state actors are essential for long term changes. The private sector should be offered fiscal and tax incentives as well as research and development incentives to invest in green technology. There was a need to devise a shared vision that transcended political cycles as the required changes can take decades. It was no longer enough to have opinions, prompt and immediate action needed to be taken.

Conclusion

The discussion highlighted several avenues which could be pursued by CDPR and partners (that include the Environmental Protection Department (EPD), World Wildlife Fund

(WWF), Lahore Chamber of Commerce and Industry (LCCI) amongst others) to develop research projects and initiatives that could be funded by IGC. Some potential areas to explore are listed below:

1. Organizing city-wide awareness campaigns using billboards, flyers, television advertisements and public service messages which highlight the health impacts of pollution to spur the citizenry into action.
2. Conducting an impact evaluation of donor funded projects targeted at climate/ environmental objectives to not only gauge their success (or failure) but to also be able to make necessary adjustments to the project. This is essential so that the money being used to fund such projects can be diverted towards better initiatives if they are not meeting the objectives.
3. Conducting a proper source apportionment study and using findings from the study to re-evaluate and model emission standards considering local realities and in accordance with sectoral activities.
4. Working with the Transport Department to support development of policies to curtail vehicular emissions.
5. Improving the accuracy, accessibility, and availability of real-time data on pollution.

References

¹Euro Emissions Standards are a set of regulations designed by the European Union to define the acceptable amount of exhaust emissions that vehicles sold in the EU can release. The standards have the aim of reducing the emissions of harmful chemicals into the atmosphere. The Euro 2 standard (1997) reduced the limit for carbon monoxide emissions and reduced the combined limit for unburned hydrocarbons and oxides of nitrogen for both petrol and diesel vehicles.

²Euro 5 further tightened the limits on particulate emissions from diesel engines and all diesel cars needed particulate filters to meet the new requirements. There was some tightening of NOx limits too (28% reduction compared to Euro 4) as well as, for the first time, a particulates limit for petrol engines – applicable to direct injection engines only.

³The real difference between the traditional Fixed Chimney Bulls Trench Kiln (FCBTK) and the zig-zag technology driven brick kiln is that in the former the placement of bricks is done in a straight pattern, whereas in the latter the bricks are placed in a zig-zag pattern. The zig-zag pattern allows to efficiently maneuver the air for heating purposes. Furthermore, the black soot that comes out of the traditional brick kiln is due to inefficient burning of fuel, whereas the zigzag setting of bricks and continuous feeding of small quantities of coal improves fuel efficiency. As a result, the emitted smoke from the kilns employing zig-zag technology is white colored and with significantly low air pollution levels.

⁴Note: When independent research was done after the workshop to understand why this was the case, it was discovered that the primary reason zig-zag technology was chosen over other efficient alternatives was because of the ease of conversion from old technology.

⁵The recommendations included: 1. Improve environmental and health data, 2. Improve the priority setting process, 3. Improve accountability mechanisms, 4. Take climate change into account, 5. Support transportation and land use scenario management, 6. Integrate air quality planning into land use, transportation, and community development plans, 7. Encourage pollution prevention, energy efficiency and renewable energy, 8. Expand the use of episodic controls, 9. Overcome potential barriers to clean energy/air quality integration, 10. Provide incentives for voluntary and innovative land use, energy, and transportation approaches, 11. Develop programs to reduce public demand for polluting activities and 12. Establish an inter-agency liaison group to coordinate land use, energy, transportation, climate change, and air quality goals

⁶An emissions inventory is a database that lists, by source, the amount of air pollutants discharged into the atmosphere during a year or other time period

⁷Source Apportionment is the identification of ambient air pollution sources and the quantification of their contribution to pollution levels.

⁸<https://www.healthdata.org/gbd/gbd-2019-resources>