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Air quality governance in Pakistan: A review of the new National Clean Air Policy (NCAP) and its limitations

By Dawar Butt and Sunil Dahiya

Summary

In March 2023, Pakistan approved the National Clean Air Policy (NCAP), followed by the Punjab Clean Air Plan (PbCAP) in April, aiming to address the country's deteriorating air quality. However, both policies exhibit shortcomings, lacking insights from peer countries and neglecting critical aspects. While some positive points include revising emission standards and prioritising an emission inventory, the policies fall short by proposing relaxed air quality standards, neglecting emission load reduction, overlooking transboundary pollution, and lacking legal backing.

The federal-level NCAP's absence of strong legal support allows provincial policies to deviate, risking weakened targets. Recommendations include enhancing air quality monitoring, tightening standards, adopting an emission load reduction approach, and developing comprehensive action plans at city/regional, provincial, and national levels. Emphasising a dynamic and globally informed policy, future amendments should address highlighted deficiencies for effective clean air initiatives.

Introduction

Air pollution is not a new phenomenon globally or in Pakistan. While cities like London, California, and Beijing have all gone through extreme air pollution periods and shown a way out towards better air, cities across South Asia are grappling with hazardous air pollution levels even now, showing limited improvements in air quality over the past years. The 2022

Rules relating to environment tribunals (1999)⁷, samples (2001)⁸, and self-monitoring & reporting by industries (2001)⁹ were established. Further, EPA’s EIA regulations (2000), along with the National Environment Quality Standards (NEQS) (2000) for industries self-reporting (2001), and motor-vehicles (2009) were also approved.

Air Pollution Regulations in Pakistan

- December 1983, [Pakistan Environmental Protection Ordinance \(PEPO\)](#)
 - Environment Protection Council (EPC) / Provincial Councils established under Provincial Laws after devolution
 - Environment Protection Agency (Pak-EPA) and
 - 1987, Provincial (Punjab) EPA
- 1997, [The Environment Protection Act \(PEPA\)](#)
 - Environment Tribunals (1999), established under PEPA as “Courts” with power to impose penalties, issue warrants, and hear appeals
 - EIA regulations (2000),
 - National Environment Quality Standards (NEQS) (2000)- Outlined the emission standards specific to industries and hazardous materials
 - Samples & Self-Monitoring & Reporting by Industries (2001)
 - National Environment Action Plan (2001)
 - Guideline for Motor-vehicles (2009) - but Motor Vehicle Ordinance not updated for improving standards
 - October 2010, [NEQS for Ambient Air](#) were approved, setting Annual and Daily limits for various gaseous and particulate pollutants in administrative territories
 - The NEQS, when notified in 2010, had set two sets of limits, one enforced during that year, and then further lowered limits in 2013

Region	Title	Year
Federal	Pakistan Environment Protection Ordinance	1983
	Pakistan Environment Protection Act	1997
	National Environmental Action Plan	2001
	National Environmental Policy	2005
Province	Eighteenth Amendment and Provincial Devolution	2010/2011
	Punjab Environment Protection Act	2012
	Baluchistan Environment Protection Act	2012
	Sindh Environment Protection Act Provincia EQS Sindh	2014 2016
	Khyber Pakhtunkhwa Environment Protection Act	2014



Figure: Air pollution regulations in Pakistan

The National Environment Policy (NEP) was approved in 2005, which accepted worsening air quality in cities and illustrated the need for managing ambient air quality. Eventually, in October 2010, the NEQS for ambient air was approved, setting annual and daily limits for various gaseous and particulate pollutants in administrative territories.

In 2010, a major constitutional amendment (18th amendment) also resulted in the devolution of most sub-national legislative subjects to the provinces, including environment protection, and the evolution of the Federal Ministry of Environment into the Ministry of Climate Change & Environment Protection. This significant change resulted in each province passing environment protection acts based on PEPA 1997 and adopting national EQS¹⁰ as provincial

⁷ Environment Tribunal: Established under PEPA 1997, the Tribunals hold the status of a Sessions Court and Civil Court, have the same powers vested in it, as outlined in the Code of Criminal Procedure and Code of Civil Procedure, respectively. The Tribunals also hold appellate jurisdiction to an order of the relevant EPA. It can impose penalties and issue bailable warrants for violations.

⁸ Samples: Rules for collection of environmental samples defined by the EPA. Consultants and laboratories operating privately also have to comply with these rules, and get registered with the EPA for samples to be considered for reporting and monitoring.

⁹ Self-monitoring: SMART or Self-monitoring and reporting requires all registered industrial units in the territory to routinely submit reports to the EPA. The frequency of the reporting period (monthly or quarterly) depends on the type of industry and its emissions intensity, i.e. highly polluting industries report on a monthly basis. The reports must follow sampling rules.

¹⁰ <https://environment.gov.pk/SiteImage/Misc/files/Rules/SRO2010NEQSAirWaterNoise.pdf>

EQS. Sindh province, however, made amendments to the PEQS in 2016¹¹, and relaxed limits for air pollutants.

Unit: Micrograms per Cubic Meter ($\mu\text{g}/\text{m}^3$)		Region				
Pollutant	Time-period	Federal	Punjab	Balochistan	KP	Sindh
Particulate Matter <2.5 μg (PM2.5)	1-hour			15		X
	24-hours			35		75
	Annual			15		40
Particulate Matter <10 μg (PM10)	24-hours			150		
	Annual			120		
Suspended Particulate Matter (SPM)	24-hours			500		
	Annual			360		
Nitric Oxide (NO)	1-hour			40		
	24-hours			40		
Nitrogen Dioxide (NO ₂)	1-hour			40		
	24-hours			80		
Sulfur Dioxide (SO ₂)	1-hour			80		
	24-hours			120		
Ozone (O ₃)	1-hour			130		
Carbon Monoxide (CO)	1-hour			10		
	8-hours			5		
Lead	24-hours			1.5		
	Annual			1		

Figure: National Environment Quality Standards in Pakistan

Legal developments

Considerable advances in environmental policies in Pakistan have resulted from litigation against governments and injunctions of the Supreme Court of Pakistan (SCP) or high courts. Clean air itself was recognised as a fundamental right by the SCP in 1994¹² when it interpreted it as part of the constitutional guarantee for the “right to life”. In the landmark case of Shehla Zia vs. WAPDA, life was defined as “covering all aspects of human existence” and not merely the human state of being alive or dead. The judge ruled, “*Life includes all such amenities and facilities which a person born in a free country is entitled to enjoy with dignity, legally and constitutionally. The word ‘life’ in the Constitution has not been issued in a limited manner.*”¹³ An analysis of case law conducted by the Legal Aid Society¹⁴ illustrates many such precedents

¹¹ <https://envitechal.com/downloaddocs/SindhLaws/SEQS%202016.pdf>

¹² Shehla Zia vs. WAPDA [PLD 1994 Supreme Court 693]

¹³ Shehla Zia vs. WAPDA [PLD 1994 Supreme Court 693]

¹⁴ “Rights? What Rights?: An Analysis of Emerging Human Rights from Constitutional Case Law in Pakistan.” Maliha Zia and Aiyan Bhutta. Legal Aid Society. 2016.

set by courts, such as the right to clean air¹⁵; right to a healthy environment¹⁶; right to protection of environment¹⁷; right to protection against air pollution¹⁸; and the right to a clean atmosphere¹⁹. In many ways, Pakistan’s environmental laws have been shaped as much through the courts as through legislation.

The most recent notable example is the “Smog Commission” established by the Lahore High Court (LHC) in 2017 and the currently active Judicial Water & Environment Commission²⁰ established in 2019, which routinely examines the implementation of regulations, and issues orders to the provincial government in case of non-compliance. While all provinces adopted regulations and rules pertaining to air quality management, the consistent focus of courts on Punjab’s “smog season” has led to further specialised plans and policies, such as the Smog Policy of 2017²¹. More recently, the World Bank-supported Punjab Green Development Program (PGDP)²² has set up a specialised unit in the Punjab Environment Protection Department (EPD) to develop capacity and improve pollution management and plans to set up a provincial air quality network by 2025.

National Clean Air Policy (NCAP) and Punjab Clean Air Action Plan, 2023: Step in the right direction but lack conviction

Pakistan approved the National Clean Air Policy (NCAP)²³ in March 2023. The policy, which has been developed under a partnership of the Ministry of Climate Change (MoCC) with international advisors, is the first official recognition and attempt at the country’s federal level to reduce worsening air pollution; a previous plan produced in 2009²⁴ was not implemented. While the policy provides an opportunity for building governmental capacity for air quality management, it leaves a lot of room for improvement and sometimes takes a step back rather than forward. The policy has identified five key sectors and one major intervention in each sector, presented as follows:

1. Transport: Implement Euro-5 and Euro-6 fuel quality standards
2. Industry: Enforce emission standards for industries
3. Agriculture: Prevent the burning of agricultural residue
4. Waste: Prevent open burning of municipal solid waste
5. Households/Residential: Promote the use of low-emission cooking technologies

¹⁵ Haji Mullah Noor Ullah vs. Secretary Mines and Minerals [2015 YLR 2349]

¹⁶ Akhtar Hussain Langovr vs. Inspector General of Police, Balochistan [2015 YLR 58]

¹⁷ Imrana Tiwana vs. Province of Punjab [2015 CLD 983]

¹⁸ Syed Mansoor Ali Shah vs. Government of Punjab [2007 CLC 533]

¹⁹ *Ibid.*

²⁰ <https://jwec.info/environment-projects-initiatives/>

²¹ https://epd.punjab.gov.pk/system/files/Policy%20on%20Controlling%20Smog%20%28Final%29_0.pdf

²² <https://projects.worldbank.org/en/projects-operations/project-detail/P165388>

²³ [https://mocc.gov.pk/SiteImage/Policy/NCAP%20\(28-02-2023\).pdf](https://mocc.gov.pk/SiteImage/Policy/NCAP%20(28-02-2023).pdf)

²⁴ <https://pbit.punjab.gov.pk/system/files/Pakistan%20Clean%20Air%20Program.pdf>

The policy document states that if the government is able to fully implement its targets nationally, PM2.5 emissions will be reduced by 38% in 2030 compared to the baseline/BAU scenario²⁵, and by 21% compared to 2020 levels. It further states that the identified interventions can reduce emissions by 81% in 2040 compared to the baseline scenario and by 70% compared to 2020 levels.

The policy ticks a few right boxes by

- highlighting the need to revise emission standards for industries and establish sectoral/industry-based emission standards;
- restricting the establishment of industries within cities;
- decarbonising the power sector;
- prioritising the establishment of an emission inventory with annual update;
- establishing periodic updates of policy and implementation plans.

The policy, however, appears to have ignored

- the importance of reducing ambient air quality concentration allowances (i.e., 5 µg/m³) and instead is proposing more relaxed ambient air quality standards than previously adopted, even while referring to the WHO's 2021 updated guidelines;
- an emission load reduction-based approach by failing to set any ambitious emission load caps and reduction targets for key sectors, cities and provinces;
- the transboundary nature of air pollution and failure to create tools and systems for air-shed levels air pollution control and governance;
- the importance of clear direction and a framework for provincial EPAs to establish regional and city-level clean air action plans with specific targets and roles/responsibilities of the regulator and the polluters;
- the absence of a strong legal backing in the form of a law and instead issues only an advisory policy.

The ambient air quality targets set in the document reverts back to the WHO's pre-2021 "interim targets" rather than advancing towards the new guidelines adopted in the WHO's 2021 update²⁶. The NEQS, when established in 2010, had two sets of limits, one enforced during that year, and then further lowered limits in 2013. However, by moving towards WHO pre-2021 interim targets, the NCAP will actually retreat on air quality standards²⁷ and the air

²⁵ Baseline = BAU: It should be noted that the document refers to the forecasted "Business As Usual" emissions as "baseline" instead of a static baseline value; hence, it is referred to as "BAU" in this review.

²⁶ <https://www.c40knowledgehub.org/s/article/WHO-Air-Quality-Guidelines>

²⁷ There is a noticeable drafting error in this major policy document: the 24-hour target stated for carbon monoxide (CO) is incorrectly written as 7000 µg/m³ instead of 7 µg/m³.

quality management regime by increasing the target PM2.5 levels by more than 50% compared to the NEQS 2013 (see table below).

PM2.5 (µg/m ³)	Time-period	NEQS 2010	NEQS 2013	WHO 2021	Proposed NCAP levels/WHO, 2021 interim guideline
	24-hours	40	35	15	75
	Annual	25	15	5	35

Figure: Stipulated concentrations of PM2.5 under various Standards by Pakistan EPD, NCAP, 2023 and WHO, 2021

Implementing this change would likely have a far-reaching impact, as all provinces may follow suit in relaxing limits as well, resulting in reduced chances of achieving success with the major interventions. However, any amendments to the NEQS have not been made so far, and the 2013 limits remain in force.

While NCAP manages to identify significant challenges, the document itself has a restricted mandate, as it is applicable only to the federal government's sphere, where the readiness to implement the interventions is limited, and in most cases beyond the jurisdiction of other ministries and departments. While provincial governments have shown readiness to develop their own policies, their capacity is further limited, and resource constraints are greater. Meanwhile, implementation at the provincial level cannot be effective without implementation at the federal level. This has in effect created a “chicken or egg” conundrum for air quality policies. The Punjab government, for example, approved the Punjab Clean Air Plan (PbCAP)²⁸ just a month after the NCAP, in April 2023, suggesting the document had already been drafted earlier and ready for approval.

This Punjab PbCAP differs from the NCAP and sets a target of 30% reductions in particulate matter, and 25% reductions in gaseous pollutants (SO₂, NO_x, Ozone, and CO) by 2030. NCAP has set no targets for gaseous pollutants but expects co-benefits for targeted interventions. Between the two policies, NCAP primarily focuses on overall achievements until 2030, while the PbCAP has set short-term (by 2024), medium-term (by 2026), and long-term (by 2030) sectoral targets.

Targeted reductions	National Clean Air Policy (NCAP)	Punjab Clean Air Plan (PbCAP)
PM2.5	38% vs Baseline/BAU, 21% vs 2020 levels	30% vs 2022 levels
NO _x	No target	25% vs 2021 levels
SO ₂	No target	25% vs 2021 levels

²⁸ <https://epd.punjab.gov.pk/system/files/230419%20Gazette%20Notification%20Punjab%20Clean%20Air%20Action%20Policy%20%281%29.pdf>

Ozone	No target	25% vs 2021 levels
CO	No target	25% vs 2021 levels

Figure: Targeted reductions for different pollutants under NCAp and PbCAP

These targets are further complicated by the fact that the policy documents do not clearly cite emissions inventories, which guided the setting of these targets. The NCAp reports that a national emissions inventory was developed and suggests that total PM_{2.5} would be reduced from ~650 kiloton in 2023 (baseline scenario) to ~500 kiloton in 2030 (see graph). However, it does not illustrate reductions in other primary pollutants and does not account for secondary particulate matter which is produced as a consequence of a reaction between those pollutants. Progress at the national level is also hard to measure and does not account for regional disparities, which requires regional and city-level emissions inventories and target-setting. Examples of this are the city-level studies conducted for Lahore²⁹ and Peshawar³⁰ cities.

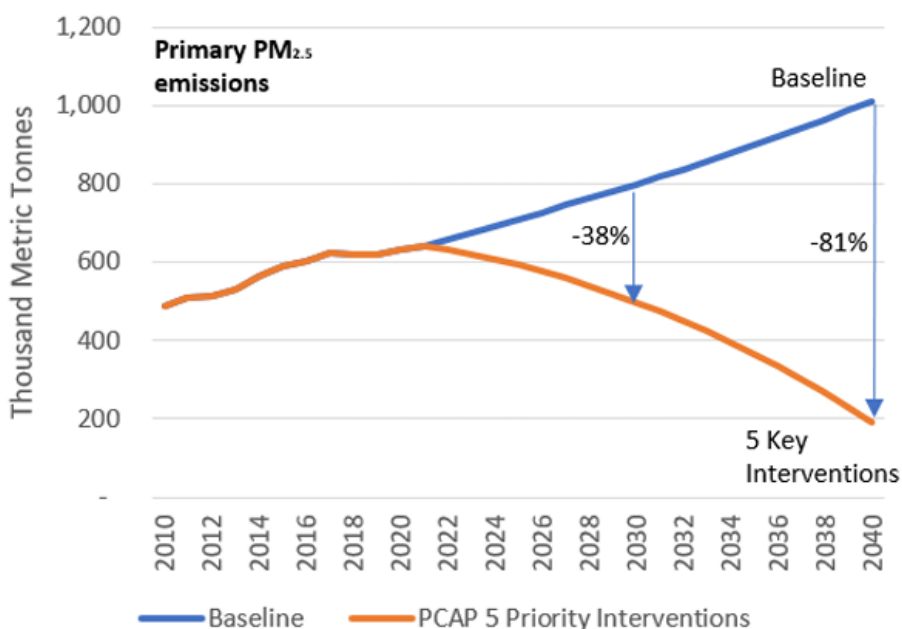


Figure: Baseline/BAU projection and targeted reduction by 2040 (Adapted from Pakistan NCAp 2023)

The PbCAP is even more opaque and does not cite an emissions inventory, on the basis of which targets may have been set. It does cite a few source apportionment studies, where each differs from the other in sectoral proportions. A 2018 Food and Agriculture Organization (FAO) study³¹ developed an emissions inventory based on 11 districts of Punjab (the province had 36

²⁹ <https://urbanunit.gov.pk/Download/publications/Files/8/2023/Emission%20Inventory%20of%20Lahore%202023.pdf>

³⁰ <https://seed-pk.com/wp-content/uploads/2023/02/APP-Report-19.04.22-WebV.pdf>

³¹ <http://www.gcisc.org/R-SMOG-Report.pdf>

districts at the time), which did not fully cover the province. It is assumed that the targets are either set on the basis of this limited assessment or have been arbitrarily adopted. After the adoption of the PbCAP, a wider provincial-level emissions inventory (covering 1990-2020) was published by the Urban Unit department of the provincial government.³²

In contrast to the NCAP development process, the PbCAP lacked a comprehensive public consultation phase. As outlined in its “Policy on Controlling Smog 2017”, the Punjab government formulated its own Air Quality Index (AQI), drawing criticism for deviating from the established US AQI standards. Notably, a report by the International Growth Centre (IGC) highlighted this deviation, suggesting a deliberate dilution of air quality categories and associated health guidelines.³³

AQI	Air Quality Category (USEPA)	Air Quality Category (EPD)
0-50	Good	Good
51-100	Moderate	Good
101-150	Unhealthy for sensitive groups	Satisfactory
151-200	Unhealthy	Satisfactory
201-300	Very unhealthy	Moderately polluted
301-400	Hazardous	Poor
401-500	Hazardous	Very poor
500+	Hazardous	Severe

Figure: Differences in US AQI and Punjab EPD AQI (Adapted from “Charting Pakistan’s air quality policy landscape”)

Recognising the need for improvement, the PbCAP has made amendments to the concentration breakpoints, aligning them more closely with the US EPA-recommended AQI categorisation, which prioritises health effects. Nevertheless, a noteworthy departure from the US AQI is the introduction of an additional “satisfactory” category, resulting in a shift for each classification. For instance, in the case of PM_{2.5}, the US AQI designates 250+ µg/m³ as “hazardous”, while Punjab categorises it as “very unhealthy”.

Policy on Controlling Smog, 2017				Punjab Clean Air Plan, 2023			
PM _{2.5} (Conc.)	AQI	Indicator	Category	PM _{2.5}	AQI	Indicator	Category
0-35	0-100	Green	Good	0-15	0-50	Green	Good
36-70	101-200	Light Green	Satisfactory	15.1-35	51-100		Satisfactory
71-105	200-300	Yellow	Moderately Polluted	35.1-70	101-150	Yellow	Moderate
106-140	301-400	Orange	Poor	70.1-150	151-200	Orange	Unhealthy for Sensitive Groups
141-300	401-500	Red	Very Poor	150.1-250	201-300	Red	Unhealthy
300+	500+	Maroon	Severe	250.1-350	301-400	Purple	Very Unhealthy
				350.1+	401-500	Maroon	Hazardous

Figure: Differences in Punjab AQI breakpoints for PM_{2.5}

³² https://urbanunit.gov.pk/Download/publications/Files/8/2023/Emission%20Inventory%20of%20Punjab%201990-2020_FD.pdf

³³ <https://www.dawn.com/news/1654542>

Another major limitation in implementing both policies is the lack of national or provincial air quality monitoring networks. Some progress has been made in Punjab, under the World Bank-supported Punjab Green Development Programme (PGDP). The PbCAP accepts this limitation and claims that 30 Air Quality Monitoring Stations (AQMS) will be operationalised in the province by 2024. The NCAP, however, does not describe any objectives for creating a national-level monitoring network. In federal jurisdiction, the Pak-EPA's monitoring network is limited to just one site in Islamabad. A monitoring network does not exist in Baluchistan, Khyber Pakhtunkhwa (KP), and Sindh provinces. Without this crucial component, measuring any ambient air quality improvements over the implementation period is virtually impossible.

The two plans agree on the need for improved compliance for industries but fall short of suggesting what mechanisms may be used to achieve this target. Standards (NEQS³⁴ and PEQS³⁵) for industrial gaseous and particulate emissions have already existed since 2000, and while an opportunity for tightening standards presented itself after devolution, the provinces simply adopted the old standards, in 2016. Compliance with these standards has been made the responsibility of the industries themselves under the self-monitoring rules³⁶, which include gaseous and particulate emissions. The same approach applies to thermal power units in major pollution-prone cities like Lahore and Karachi. The outdated standards and a lack of transparency in monitoring leave a significant gap that could have been addressed in the PbCAP while NCAP mentions the need to revise these standards. In recent years, a move towards industry-specific pollution standards has been seen instead of generalised limits, such as in China³⁷, to target the most polluting industries.

Both India and China have also come up with regulations to control air pollution in their respective geographies, while the new policy in Pakistan provides limited guidance in regard to inter-provincial or inter-regional air quality management within the country. Lastly, although both NCAP and PbCAP have highlighted the need to coordinate for transboundary air pollution issues - especially between Punjab (Pakistan) and India (Punjab & Haryana) - both documents do not refer to the Malé Declaration³⁸, which agreed on guidelines for developing transboundary coordination on air pollution in South Asia.

³⁴ <https://environment.gov.pk/SiteImage/Misc/files/Rules/SRO549I2000NEQS.pdf>

³⁵ https://epd.punjab.gov.pk/system/files/NOTIFICATION_REGARDING_THE_PUNJAB_ENVIRONMENTAL_QUALITY_STANDARD_S_FOR_INDUSTRIAL_GASEOUS_EMISSIONS%20%281%29.pdf

³⁶ https://epd.punjab.gov.pk/system/files/NEQS_SMART_Rules_2001_0.pdf

³⁷ http://english.mee.gov.cn/Resources/standards/Air_Environment/index_2.shtml

³⁸ <http://www.sacep.org/programmes/male-declaration>

Conclusion

It is a step in the right direction to have a National Clean Air Policy and Punjab Clean Air Action Plan but Pakistan's first step towards clean air appears to be a restatement of already existing statutes and regulations, repackaged along with limited evidence to support appropriate targets. The National Clean Air Policy has limited application in terms of jurisdiction and does not set a "minimum achievement floor", which, as evidenced by the Punjab Clean Air Plan, allows provinces to set toned-down targets. The targeted reductions are also based on a national emissions inventory, not taking into account the regional variations of emissions and their sources. There are also clear signs regarding the lack of coordination between the federal government and provinces regarding the key components of air quality monitoring and inter-provincial air quality management, which are not covered at all in the national plan. Nevertheless, both documents show an official recognition of worsening air quality and a public health crisis - including the fact that 235,000 Pakistanis die annually due to air pollution.

The creation of a national clean air policy should be seen as a foundation for further targeted and evidence-based clean air initiatives and should be a dynamic policy document that should at least follow key learning and components from efficient air pollution regulation policies globally, and include the following policy recommendations:

- Enhance ambient air quality monitoring across cities and rural areas to help understand the widespread nature of air pollution and directed actions.
- Tighten ambient air quality guidelines rather than relaxing them and make efforts to move towards WHO guideline levels.
- Establish an emission load reduction-based approach by setting ambitious emission load caps and reduction targets for key sectors, cities and provinces.
- Develop regional, provincial and national clean air action plans with specific targets using an air-shed-based pollution reduction approach.
- Tighten emission standards for the industry sector while enhancing the polluting sectors' reporting, transparency and accountability for public disclosure of emissions and their systematic reduction.