

Legal Responses Toward Air Pollution-Related Environmental Crimes: An Analytical Study of District Multan

Dr. Altaf Ghani¹, Muhammad Nazuk Shahzad², Dr. Hassam Ahmad Hashmi³

¹Assistant Professor, Institute of Social and Cultural Studies, Bahauddin Zakariya University, Multan, Pakistan.

Email: altafghani@bzu.edu.pk ORCID: <https://orcid.org/0009-0006-5833-2018>

²M.Phil. Scholar Anthropology Institute of Social and Cultural Studies, Bahauddin Zakariya University Multan, Pakistan. Email: naz1975shahzad@gmail.com ORCID: <https://orcid.org/0009-0005-8410-6121>

³Research Associate, Punjab Center of Excellence on Countering Violent Extremism, Home Department, Punjab, Pakistan Email: hassamhashmi666@gmail.com ORCID: <https://orcid.org/0000-0001-5274-8051>

Abstract

The enforcement of the law is the key point to make it effective, and air pollution is still a huge issue in Pakistan, affecting the environment and the health of the people. The study uses a mixed-method design that analyses the legal and governmental responses to the environmental crimes related to air pollution in the District of Multan. Secondary material consisted of environmental laws, policies, official air-quality material and related studies. There were 53 respondents, 32 public and 21 traffic wardens and the primary data were gathered from them. The closed-ended answers were analyzed descriptively, while the open-ended answers and interviews were analyzed thematically. People's awareness was high; 30 respondents (93.8%) saw vehicles as a major pollution source and everybody saw pollution as serious or very serious. However, 24/31 (77.4%) respondents to the questionnaire indicated financial problems associated with compliance. Fifteen (71.4%) of the traffic wardens were trained, but the lack of equipment, public resistance, staffing restrictions and administrative pressure reduced the effectiveness of traffic enforcement. The study concludes that the implementation is the major constraint.

Keywords: Air pollution; Environmental crime; Regulatory Enforcement Theory; Environmental law; Traffic wardens; Multan; Pakistan

Introduction

Air pollution is a recurring environmental problem in Pakistan, especially in Cities, where transportation, industry, construction, agricultural burning, waste burning, and the rapid population growth have a synergic impact. The city of Multan is a useful district-level setting for the study of the problem, with its high levels of road traffic, industrial and agricultural activity. In the thesis, the major factors causing poor air quality in the district are identified as vehicular emissions, industrial activity, construction dust, open waste burning and agricultural operations. The concern, as such, is larger than a single source or a single offending group. Air pollution is a matter of daily life, regulation, institutional capacity and public compliance.

A legal answer has come into existence. The Pakistan Environmental Protection Act, 1997 is the main national legislation and the Punjab Environmental Quality Standards, Smog Controlling Policy, National Clean Air Policy and administrative orders are other tools for controlling

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Corresponding Author Email: hassamhashmi666@gmail.com

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emissions and monitoring air quality. The thesis review also documents government actions with respect to vehicle inspection, fuel quality, construction dust, stubble burning, air-quality monitoring and public advisories. The fact that these instruments are present indicates that the issue of whether rules exist is no longer the central question. The question is if rules are translated into regular monitoring, credible enforcement and sustained compliance.

Air pollution is relevant to criminology because it can result from actions which are in violation of regulatory standards and because enforcement actions decide which acts are detected and sanctioned as harmful. Environmental offences are unique in one important respect from the traditional street offence: they may have multiple perpetrators including drivers, industry, public authorities and larger systems of production and transport. Legal enforcement thus requires not only technical capacity and coordination, but also penalties.

It is particularly important to the system of enforcement that traffic wardens, officers and inspectors be in place. They directly come into contact with vehicles, see smoke visible from the vehicle, speak to drivers and can start enforcement. Their work also highlights the limitations of roadside regulation. A warden might know that an emission is in violation, but not have the necessary equipment to measure the emission scientifically. There is an ability to be authorized by an officer to enforce a rule that they may come across resistance of the people or administrative pressure. These experiences are useful tools for analysing the gap between the law and practice when it comes to traffic warden duties.

Complementary to public respondents is the perspective of the public respondents. People who use vehicles are vulnerable to polluted air but they are also co-producers of emissions via the vehicle transport system. Knowledge of pollution, awareness of legal requirements, maintenance practices, financial situation and perceptions of government action are factors that influence compliance. The thesis results indicate that there is a difference between the perception of the environment and environmental compliance. Individuals may be aware of the negative impacts of vehicle emissions but are still having trouble keeping those vehicles running due to the expenses of repair, testing, and servicing.

The study focuses on two questions: What are the laws and policies related to air pollution in Punjab, and are the existing laws and policies effective in reducing air pollution? Public awareness, vehicle maintenance, the perception of the government measures, the role of traffic wardens, and barriers to implementation are also explored. The mixed-method approach was used in the article, since the numerical responses reflect the distribution of a position on the issue, whereas the qualitative responses provide explanations for the distribution and describe the experiences behind it.

Recent Studies

Studies on air pollution in Pakistan have evolved in various fields including environmental sciences, public health, law, governance, and criminology. Bilal et al. (2021) analyzed the long-term record of aerosols and trace gases over all of Pakistan and highlighted the areas of severe pollution which are major urban centers. Mohyuddin et al. (2024) studied PM_{2.5} in the most intense haze period in Lahore and Anwar and Younes (2025) studied the pattern of PM_{2.5} & NO₂ in Lahore and Multan using remote sensing. The latter study is relevant to the research

because it enumerates some of the factors that contribute urban pollution such as traffic pollution, factory activity, and agricultural residue burning.

Studies oriented to health make it clear for reasons beyond environmental measurement why regulatory weaknesses matter. Common air pollutants were linked to greater illness by Chen and Kan (2008) and Manisalidis et al. (2020) examined the effects on respiratory, cardiovascular, cancer, and other health outcomes of polluted air. The studies conducted by Ishfaq et al. (2024) and Gill and Ishfaq (2023) also reveal that household situation, awareness, ventilation, income, and availability of cleaner practices influence air-quality issues in Multan. Air pollution requires a social capacity to respond to the exposure, as well as exposure.

The definition of environmental offending has been expanded by criminological research. Faure (2009) suggests that environmental crime is very closely linked with rules and regulatory incentives, but Shover and Routhe (2005) focus on issues of detection and low punishments. Coordinated responses that involve multiple institutions, rather than a policing response alone, is needed to deal with environmental crime, Wright (2011) reminds us. Tymoshenko et al. (2022) also pinpoint environmental investigation and emission data collection as areas of weakness, and calls for more early engagement of environmental professionals, and for increased institutional coordination. They are important to Multan because the field findings reveal that there are various different types of enforcement capacity held by traffic wardens and environmental authorities.

Implementation has been a recurring theme as a major issue in studies focusing on Pakistan. Sial (2018) studied environmental laws and highlighted the repercussions if there was non-compliance. Additionally, in the context of Punjab, Amjad et al. (2022) reviewed the aspects of air-quality governance and found that it is not as effective as it could be due to resource limitations, coordination issues, and low public awareness. Butt and Dahiya (2023) reviewed air-quality governance and identified weaknesses in monitoring, enforcement, and emission reduction. Aslam (2024), while also presenting the policy interventions that can be adopted to make the plan environmentally friendly. Afnan and Ghani (2024) discussed the challenges of enforcement and public participation in the smog response in the case of Punjab.

Issues in the institution are still being identified in recent study. Zahid et al. (2025) reviewed the policies in Pakistan, and observed that there is a fragmentation of policies, lack of proper utilization of air monitoring networks and the need for better coordination between national and regional authorities. Again and again, both Hussain and Bilal (2026) talked about legal frameworks, institutions and enforcement procedures, as well as supervision, qualified staff and institutional clarity. It is noteworthy that Pakistan does not have an altogether lack of environmental law. The greater challenge is the monitoring, interpretation, coordination and enforcement, at operational level, of legal rules.

Before embarking on a district-level empirical study of the relationship between public awareness and frontline enforcement, it is valuable to know that the relationship is likely to be weak or even nonexistent. The literature available tends to be on concentrations of contaminants, the health impacts, national policies or a general legal approach. The current research seeks to evaluate the relationship of these attributes with the experiences of the vehicle users and traffic wardens of Multan. Also, the implementation focus offers a tangible ground for the application

of Regulatory Enforcement Theory which highlights the vital features of monitoring, credible sanctions, institutional capacity and formal norms against actual compliance.

Regulatory Enforcement Theory

The most direct framework in which a study such as this can be carried out is the one of Regulatory Enforcement Theory, a theory which is based on the premise of whether or not environmental laws and policies are effective in practice. The theory emphasizes factors that can influence the effects of rules on behavior: the ability to monitor, detect violations, and have a credible sanction, and to have the authority and resources necessary to implement the rule. A formal rule can thus not be considered as an effective regulation.

The theory becomes more apparent when environmental regulation is understood as a series of actions. A legal standard sets standard of behaviour. Monitoring helps to identify potential non-compliance. Often, a consequence will be issued to transform a violation into a warning, ticket, repair order, etc. Compliance will rely on the availability of actors to be compliant as well as on the possibility of future non-compliances being identified. If there are any breaks at any point, the usefulness of the rule is severely damaged.

The results of the Multan findings are closely aligned with this framework. Pollution awareness was shown to be very high among public respondents, however, it was acknowledged that the expenses of keeping their vehicles up to scratch is high and compliance is not readily available. The traffic wardens said they were able to control environmental laws, but had no equipment for conducting emission testing. Equipped with administrative pressure and public opposition, plus enforcement problems. The theory thus explains why there can be so much regulation in law and the continued presence of pollution. Not only is the standard the problem, but the institutional and social conditions under which the standard is applied.

The framework also gives an analytical framework to learn from the gap between legal power and enforcement experience. Most traffic wardens felt that the restrictions were usually acceptable in principle but many highlighted lack of equipment, too much labor, criticism from the public and political and administrative involvement. Regulatory effectiveness, therefore, is not necessarily a matter of good or poor legislation in this research but rather an institutional product.

Research Methodology

This study is a mixed-methods research approach because it examines the formal legal reaction as well as the experiences of those in interaction with the formal legal reaction. The thesis integrates law, documentation and quantitative, qualitative primary data. The present article has the same general design but focuses the empirical analysis on the public and traffic-warden responses that are associated with the research questions.

The population comprised two groups in District Multan, general public and traffic wardens of the district. Because both groups were directly related to the research goals, Purposive sampling was used. People were added as public respondents since they drive, exposed to air pollution and are supposed to meet environmental standards. The inclusion of traffic wardens was included as

they have role in traffic management and road-side enforcement of vehicular emissions. The final sample consisted of 53 respondents, 32 public respondents and 21 traffic wardens.

The other secondary data gathered comprised national and provincial environmental laws, Pakistan Environmental Protection Act, environmental standards, government policies, administrative orders, air-quality reports, and relevant academic literature. A structured questionnaire was used for the random public and a semi-structured interview guide was used for the traffic wardens. The public instrument contained mainly closed-ended questions with opportunities for open-ended comments. The topics discussed in the interviews with the traffic-wardens include training, legal knowledge, enforcement practices, equipment, implementation issues, effectiveness of policy, interference, workload, and conflict.

Data was collected online and on-site over 14 days. Subjects were informed about the study, participants were asked to take part freely and personal information was kept confidential. For closed-ended questions, frequencies and percentages were used to present the data. They were then organized thematically in open-ended responses and interviews into the following areas: Awareness, Maintenance, Policy Effectiveness, Policy Enforcement, Institution, Technical Capacity, Public Resistance.

Age, gender, education or occupation was not collected on the thesis instruments. The above variables are thus not mentioned in the article, as if they were it would need information which is not supported by the source material. Table 1 shows the available respondent profile in terms of group composition, vehicle characteristics for public respondents and training status for traffic wardens. It is better to report the available profile rather than to create them from scratch.

Table 1. Respondent demographic and sample profile

Variable	Category	n	%
Respondent group	General	32	60.4
	public/vehicle users		
Respondent group	Traffic wardens	21	39.6
Public vehicle type	Bike	22	68.8
Public vehicle type	Car	10	31.2
Public ownership/use	Self-owned	28	87.5
Public ownership/use	Commercial/public transport	4	12.5
Traffic-warden training	Received smog/emission training	15	71.4
Traffic-warden training	No special training	6	28.6

Note. Source: Field data from the thesis dataset. Percentages are reported using the applicable respondent denominator; items with 31 valid public responses are identified in the text.

Results and Discussion

The results show a “conflict” between awareness and compliance as it appeared across the findings. There was a general recognition of air pollution as a serious issue, with awareness of the impact of road transport, but practical challenges were identified as the barriers to maintenance and compliance. Although traffic wardens were aware of their legal mandate on emissions, equipment and institutional assistance to ensure regular implementation of the laws was not always available. The quantitative patterns and the qualitative extracts converge along the same implementation issue from two angles.

Respondent profile and vehicle use

There were 32 public respondents (60.4%) and 21 traffic wardens (39.6%) in the combined sample. Twenty-two respondents (68.8%) in the public group reported riding their bikes while 10 respondents (31.2%) reported driving a car. 28 respondents (87.5%) used self-owned vehicles, four (12.5%) used vehicles for commercial or public transport. Individually owned vehicles are relevant for the concentration as the responsibility for regulation is shared to some extent between the individual users, who are responsible for the decisions about service, repair, or replacement of their vehicle.

Since age, gender, education and occupation were not included in the questionnaire and in the interview guide, a conventional table of these variables would not be available in the available profile. Rather, the characteristics actually collected are recorded in Table 1. The demographic presentation is anchored in the vehicle and enforcement profile, which is the starting point derived from the empirical material.

Public awareness of air pollution and government policy

There was high awareness about vehicular pollution. The majority of public respondents (30, 93.8%) were aware of the vehicles as a significant source of air pollution, and two (6.2%) were somewhat aware. Less people were aware of particular government policies: 25 (78.1%) knew about government policies regarding vehicle emissions and anti-smog measures, and seven (21.9%) did not. 100% of respondents considered air pollution serious with 23 (71.9%) very serious and 9 (28.1%) serious.

General awareness vs. Legal awareness is important. A participant explained,

Yes, I do feel that vehicles contribute to air pollution, industries do and if vehicle emissions could be controlled the pollution problem would be less.

The participant did not minimize pollution for transport only. Another participant said,

As far as I know, there are some government policies to minimize smoke emissions from cars etc. but I don't know them completely.

So, knowledge of the problem was wider than knowledge of the regulatory instruments addressing the problem.

This discovery reinforces the knowledge base in the area of public health and environment. Bilal et al. (2021) highlight the extent of urban air pollution in Pakistan and Chen and Kan (2008) and Manisalidis et al. (2020) show the health impacts. Local evidence from Lahore and Multan has been added by Anwar and Younes (2025) identifying other anthropogenic sources such as traffic. This matches the findings in the current study, which showed that people were aware of the presence of vehicular emissions, but were less aware of specific policies, thus indicating a lack of the full effect of awareness campaigns on legal knowledge.

Experience of smog was also used as a means of conveying the seriousness of the issue. One respondent stated,

It is getting more and more polluted every year and during the smog season it is difficult to breathe, people suffer when going outside.

Another participant felt that the issue may be addressed if the government policy is followed correctly. It is important to note that the comments are not just remarks on the deterioration of the environment, but rather links it to the expectations regarding enforcement, not just pollution as a seasonal reality.

Vehicle maintenance and the cost of compliance

17 respondents (53.1%) reported that they did regular maintenance, 11 (34.4%) did occasional maintenance, and four (12.5%) did the maintenance rarely. High cost of the product was the greatest constraint reported by 17 respondents (53.1%), time constraints by 9 (28.1%) and lack of facilities by 6 (18.8%). The findings suggest that there is no direct link between awareness and regular maintenance.

One respondent said that she was a "reactive" service provider:

I don't go to the mechanic often; only when a big problem occurs or the car doesn't work as well.

Another participant explained,

This is a little costly and time consuming, I do it myself, but I'm not an expert, perhaps the services I do are not very effective.

Another participant said the economic dimension was more clearly expressed in the following:

The most difficult aspect is the expenses for repairs and maintenance. Not everyone can afford to be serviced on a regular basis.

There are regulatory implications for enforcement. An owner may know why it is good for the environment to do maintenance but may not be able to afford it regularly due to the high expense of the maintenance. Resource constraints are cited as a hindrance in air-pollution prevention in Punjab by Aslam (2024) and economic factors are revealed to affect exposure to and management of air-pollution risks in Multan by Ishfaq et al. (2024). The present findings are an extension of the aforementioned. Without the ability to afford the cost of compliance, regulation becomes less convincing.

The problem can be understood with the help of the theory of regulatory enforcement. Monitoring and sanctions can help to identify a poorly maintained vehicle, but sanctions cannot provide the necessary resources to repair the vehicle. A realistic compliance pathway is needed for effective regulation. Inspection and maintenance facilities, testing and support for cleaner transport can be used alongside sanctions, they are not an alternative to them.

Perceptions of government measures and enforcement

Public opinion on anti-smog measures was a combination of mixed and not-negative. 18 (58.1%) felt that government measures were a bit effective, seven (22.6%) felt that they were effective and six (19.4%) felt that they were ineffective. For this item, there are 31 valid responses. The distribution indicates a cautious recognition of the action of the government, and implementation is the primary concern.

One participant observed

I'm fairly optimistic about the impact of government measures, because they're getting people to become aware of the importance of emissions control on vehicles, and they're giving them information about it, but there needs to be a bit more rigour in the monitoring.

Another stated

There are some actions being undertaken by the government, but the impact is not immediately apparent and policies need to be in place but not just talked about.

Both comments get to a practical issue, visibility of policy is not the same as effectiveness of the policy.

Butt and Dahiya (2023) and Amjad et al. (2022) come to similar conclusions from different sources, while Sial (2018) and Aslam (2024) do so from other sources. Pakistan has formulated environmental laws and policy tools, but there is inconsistent monitoring, coordination, resources and enforcement. The same pattern is evident in the community level in the Multan respondents. They are able to see the government action, but not enough and not consistently enough, for them to have a high level of confidence in the system.

There was a low level of experience of inspection among public respondents. Of those respondents who did respond (21, 67.7%), 10 reported they had been checked or fined for smoke emissions, with 21 (32.3%) saying they were not checked or fined. A respondent also questioned the proportionality, but stated,

As bike produces very low pollution as compared to carriage truck, there is no much difference between these two in the fines.

The answer indicates a focus on enforcement criteria that are clear and credible. Penalties have a greater sense of fairness if the public knows the reasoning behind treating different types of vehicles differently.

It was even more costly the financial side. Seven (22.6%) of the 24 respondents who were valid reported no financial difficulties with environmental policies, while 7 (77.4%) reported financial difficulties. One participant described maintenance, repairs, and emissions testing as being costly because they were required on a regular basis and were hard to control. Awareness campaigns (32.3%), transparency and fair enforcement (25.8%), improved public transport (22.6%) and subsidies or incentives for maintenance (19.3%) were suggested in the public section. A respondent wanted to inform car owners, and offer them less expensive methods to cut emissions, rather than just imposing penalties.

Table 1. Public preferences for less burdensome pollution policy

Suggested measure	N	%
Awareness campaigns	10	32.3
Transparent and fair enforcement	8	25.8
Better public transport	7	22.6
Subsidies/incentives for maintenance	6	19.3

Note. Source: Field data from the thesis dataset. Percentages are reported using the applicable respondent denominator; items with 31 valid public responses are identified in the text.

Such preferences do not amount to resistance to environmental regulation. They propose compliance requirements which are economically feasible. The discovery also aligns with the ideas of Zahid et al. (2025) in relation to approaches based on reward and community engagement, in addition to methods of regulation. The same reading can be made from a regulatory enforcement theory perspective: Compliance is better promoted through sanctions, but where regulated actors can meet the standard and where enforcement is regular, that is.

Traffic wardens: training, legal knowledge, and enforcement capacity

71.4% of the traffic wardens (15) said that they had been given training about smog or vehicle emissions, whereas 28.6% (6) had not received special training. The quantitative result suggests a high level of exposure to environmental training, but the qualitative result casts doubt on this. One officer stated,

Yes, we were briefed on emission related matters and how to spot excessive smoke emitting vehicles but more practical training is needed.

Another said,

NO, I don't think I've been given any particular training in smog or vehicle emissions, most of it I have learned from experience when I'm doing my job.

The Traffic wardens cited the Motor Vehicles Ordinance 1965, the National Environmental Quality Standards and the Punjab Environmental Protection Act, PEPA 1997.

We are implementing the Punjab Environmental Protection Act. In addition, there are National Environmental Quality Standards (NEQS) for the exhaust of vehicles which specify limits for smoke.

The other mentioned legal prohibition of excessive smoke and Pollution Under Control certificate. The answers indicate that it is not legal awareness that is the main issue.

The more serious issue is related to technical capacity. Typically, officers said, they do not have emission-testing equipment around and instead expect to see it being used by environmental authorities. One officer stated,

No, we don't have any equipment, when the environmental department comes here for them to check together they take their equipment.

Another simply said,

Not really, we are not provided with any equipment.

A third officer summarized the operational problem:

There are no tools to be used for inspection and there are many cars - it is very hard to inspect any car by visual inspection only.

The equipment issue is directly related to the credibility of the regulators. While it is obvious that there is a problem with the visual smoke, objective assessment is required in order to comply with scientific emission standards. The same issues in detection and collection of emission data are highlighted by Tymoshenko et al. (2022), as is the need for coordinated institutional responses by Wright (2011). The Multan evidence highlights the importance of coordination. Traffic wardens have access to the roads while environmental authorities have the testing capabilities. An effective link between the two is essential if enforcement is to be complete.

Vehicles smoking were stopped, fines issued, drivers were reminded to get vehicles repaired, and given directions to get a Pollution Under Control certificate. One officer stated,

Require the driver of the vehicle to immediately take steps to reduce pollution and fine the driver of the vehicle.

Another explained,

I was able to stop the vehicle, give the driver a ticket, instruct the driver to fix the vehicle and obtain a PUC certificate.

So the officers do have a regulatory function, but as the evidence shows, their ability in that respect is more on the starting side than in the scientific verification of emissions.

Public resistance, workload, and administrative pressure

Ten respondents (47.6%) cited public opposition as the biggest issue for traffic wardens. Four (19.0%) reported lack of staff, four (19.0%) reported corruption, and three (14.3%) reported unclear laws. One officer explained,

So many drivers are prone to getting angry when they get caught for their emissions failure, making it hard for cops to enforce.

Still another officer wrote that lack of proper equipment made it more difficult to make a proper measurement.

The public findings offer context to officer's description of resistance. Cost of maintenance and emission related compliance were reported as significant financial burdens for the vehicle users. An enforcement encounter can thus be not only a legal dispute, but also a struggle for life. An enforcement encounter can turn into a cost, fairness and perceived legitimacy issue. Next to the officers' account of confrontation stands the public's demands for transparent enforcement and cost-effective compliance. To the public's call for transparency in enforcement and cost-effective compliance stands the officers' account of confrontation. Both groups are speaking of two aspects of the same regulatory experience.

Of the 14 traffic wardens (66.7%) who said there was political or administrative interference, seven (33.3%) said they did not. One officer stated,

Due to the nature of their person or political connections, it may be possible for influential individuals to evade penalties at times.

Another explained,

Identifying high value offenders and enforcing pressure can be complex. Such accounts are important as it is imperative that credible enforcement is maintained by the expectation of a similar response to similar offences. The deterrent impact of the rule is reduced if the offenders who could influence it are not subject to penalties.

The issue is similar to the challenges faced in implementing discussed by Sial (2018), Butt and Dahiya (2023), Hussain and Bilal (2026). Each of those studies identifies a set of problems in supervision, institutional capacity or enforcement, although each study is focused on a different scope of problems. The concern takes shape of frontline with Multan interviews. Officers talk not about the lack of a set of rules for the street, but about their question of whether a set of rules can be followed independently and consistently at all times.

Perceived effectiveness of laws and the implementation gap

Sixteen traffic wardens (76.2%) believed that existing law was effective in reducing air pollution, five (23.8%) believed it was not. The outcome is significant, since it will not allow the conclusions to be interpreted as a general disaffirmation of environmental law. Generally, officers felt the legal system could work. They had questions about how it would be implemented.

One officer captured the distinction by saying,

They have good laws but good implementation and cooperation with the public is needed.

Another stated,

The rules have a good idea of them, but don't always live up to them in practice.

The comments are very aligned with Regulatory Enforcement Theory. Formal rules set the bar, but the results rely on monitoring, collaboration, credible sanctions, and institutional capacity.

The pattern shows up in the literature as well, which has a Pakistan theme. Although environmental laws are available, Sial (2018) found non-compliance to be a main weakness. Amjad et al. (2022) reiterated the need for cooperation and enforcement, whereas Butt and Dahiya (2023) underscored a need for better monitoring and legally enforceable clean air measures. Aslam (2024) noted that policy designs can be suitable for the context of Punjab but implementation may be hindered by resource constraints, lack of coordination, and the lack of awareness. The problem of implementation is evident in Multan as per the current evidence not only through a documentary review but by two respondent groups.

Environmental policies had a mixed impact on professionals' efficiency. 57.1% of officers said their efficiency improved, 23.8% said it remained the same and 19.0% said it decreased. Environmental responsibilities were not, therefore, seen as an extra burden for everyone. Over half said the policies helped them to detect and react to violations. One officer said,

The policies have supported us very well in our attempts to discover and take corrective measures for environmental offences.

Table 2. Effects of environmental policies on traffic-warden work

Measure	Response	N	%
Effect on professional efficiency	Improved	12	57.1
Effect on professional efficiency	No change	5	23.8
Effect on professional efficiency	Reduced	4	19.0
Conflict during enforcement	Yes	17	81.0
Conflict during enforcement	No	4	19.0

Note. Source: Field data from the thesis dataset. Percentages are reported using the applicable respondent denominator; items with 31 valid public responses are identified in the text.

There was greater conflict. Of the 17 officers who experienced conflict during enforcement, 81% did; of the four (19%) who did not, 4 reported that they had not. One officer noted that some citizens have found themselves being ticketed and responded negatively, and another officer mentioned that other officers intervened. The public opposition and institutional pressure combine to create a challenging enforcement environment. The officers are expected to abide by the rules of the environment during the performance of their normal traffic duties, public relations and administrative duties.

Both the public and the traffic-warden responses are notable for their agreement on one issue: air pollution is a serious issue but the public and traffic-wardens have different barriers to action. The public respondents highlighted financial constraints, lack of knowledge about available legal actions, inadequate surveillance and poor transport options. Technical equipment, manpower, public resistance, workload, and administrative interference were all issues which were

highlighted by traffic wardens. The two views focus on implementation and do not disagree about the importance of pollution.

Integrating the two respondent perspectives

The policy framework also implies what motivates the need for a multiagency response, which is likely to be insufficient. Environmental authorities and traffic wardens do the specialized monitoring and technical assessment at the interface of the vehicle and the driver(s). The local government, agriculture, industry and district administration are responsible for other pollution sources. Coordination is especially needed when dealing with the timing of smog, because there may be a time when the source of the pollutants, such as vehicle exhaust, agricultural burning, industrial activity, construction dust and waste burning, has happened. Thus, the concern raised by the respondents about the lack in coordination of the equipment and institutions arises not as an incidental but rather as a structural feature of environmental regulation.

The difference in them is significant if the documentary and field evidence is juxtaposed. The standards, inspection requirements, institutional responsibilities and enforcement powers are described in policy documents. Public respondents report uncertainty about specific policies, financial issues in compliance, and limited exposure to inspections. Legal knowledge and insufficient technical tools and competing operational responsibilities are described by traffic wardens. A regulatory framework may then be extensive in terms of paper but have mixed results in terms of experience on the street. Regulatory Enforcement Theory captures the difference by focusing on how a formal standard becomes a reality and is enforced.

The thesis also explored administrative orders that were issued during 2025. The initiatives undertaken were emissions test for vehicles, control of fuel quality, dust control in construction sites, dissemination of AQI, prohibition of stubble burning, public advisories. The unhealthy and very unhealthy were observed repeatedly during the studied period, whereas the hazardous category was recorded during the same period. Official AQI material indicated that unhealthy and very unhealthy were observed repeatedly during the studied period while the hazardous category was observed during the same period. Legal activity could thus be discerned from inspections, fines, sealings and other administrative proceedings.

The Punjab Environmental Quality Standards set measurable standards of ambient air quality and contain ambient air parameters including Sulphur dioxide, Nitrogen oxides, Ozone, Carbon monoxide, Suspended particulate matter, PM10, PM2.5 and Lead. The Smog Controlling Policy included provisions focussed on the seasonal smog problem, such as on industrial processes and cleaner fuels. The National Clean air Policy 2023 expands the scope of the response by incorporating the aspects of transport, industry, agriculture, waste management, households, fuel quality, cleaner technologies, public transport and air-quality monitoring. It is thus recognised in the policy architecture that pollution is a multi-source phenomenon that needs a sectoral response.

The legal review gives background information as a tool for interpreting the field responses. The Pakistan Environmental Protection Act, 1997 is the prime legislation and principle on environment protection and pollution control in the country. The Act is supported by rules and regulations relating to environmental samples, industrial self-monitoring, laboratories, pollution charges, environmental assessment and administrative penalties. The 18th Amendment, which

devolved power from the national to provincial authorities, gave provincial institutions a greater say in environmental governance. Punjab thus formulated its own environmental criteria and administrative procedures, moving away from a single enforcement system to a multi-layered system.

Integrating the two respondent perspectives

In one way, the concern of the public and the traffic wardens is very similar: Both groups see air pollution as a significant issue, but they see different obstacles to action. Financial pressure, lack of knowledge on available legal tools, lack of consistency on monitoring, and poor transport alternatives were highlighted by public respondents. Technical equipment, staffing, public resistance, workload and administrative interference were highlighted by traffic wardens. The two views thus focus on implementation, rather than on whether pollution is of concern.

The convergence reinforces the interpretation given by Regulatory Enforcement Theory. A regulatory system must have a relationship of rules, monitoring, enforcement and compliance. However, public awareness provides a base for compliance, but maintenance costs can erode this. Officers' legal knowledge helps in the enforcement, as does equipment, but only to a certain degree in verification. Penalties are an official action (formal consequence), but opposition and political pressure can diminish the credibility of the penalties. Some of these gaps can be addressed through inter-agency coordination, but the thesis results show that there is still a lack of coordination between agencies.

The legal material examined in the thesis is very extensive. A national framework for environmental protection is given by PEPA 1997 and PEQS 2016 are ambient air-quality standards. The Smog Controlling Policy and the National Clean Air Policy provide policy responses for transport, industry, agriculture, waste and other sources. Other matters covered by government orders include vehicle testing, fuel quality, construction dust, AQI dissemination, stubble burning and other sources of pollution. The field evidence indicates that this is not a lack of instruments. The weakness is that those instruments are not operating in the way that they need to be operating to support everyday behavior.

The official AQI material in the thesis further emphasizes that there is a need to have consistent enforcement. Repeated unhealthy and very unhealthy category is reported for the year 2025 for Punjab with a hazardous reading recorded on 11 December 2025. Even the existence of formal air-quality monitoring and public advisories demonstrates the state's ability to create information and give directions. If what is being said by the respondents is taken into consideration, the next step is not only to give seasonal attention but also to implement sustained enforcement and institutional follow-through.

The study also contributes to the broader debate on environmental governance. Zahid et al. (2025) note the policy fragmentation and call for more integration of monitoring systems. Afnan and Ghani (2024) draw attention to the public response to the Punjab smog. Ishfaq et al. (2024) illustrate the impact of socioeconomic factors on household air-quality management and Anwar and Younes (2025) present the importance of remote monitoring in Lahore and Multan. These studies suggest a more comprehensive regulatory landscape in which enforcement, information, public behavior and technical systems must all reinforce each other.

A regulatory theory that synthesizes this is Regulatory Enforcement Theory, which does not assume compliance will follow the law. The four weaknesses in the Multan evidence are rooted in limited technical equipment for monitoring, public and administrative pressures on enforcement, institutional capacity due to staffing and workload, and the cost of complying with the requirements of the vehicle user. The legal system now has a basis in place, though the regulatory process needs better operational support in order to achieve the desired environmental results.

Another implication is with regard to institutional specialization. Traffic wardens cannot reasonably be expected to perform all of the responsibilities of the environment, traffic accident and public assistance duties along with the normal duties of traffic control. Roadside officers do not always have the expertise of environmental agencies. A valuable referral and joint-inspection process, yet not an aggravation to any single institution, may be able to give the regulatory chain greater effectiveness. It confirms the results of other researchers, such as Wright (2011), Tymoshenko et al. (2022), and Zahid et al. (2025), who emphasized the importance of coordination and information capacity for environmental enforcement.

The legal review also shows that enforcement actions are now starting to surface under the guise of air-quality advisories, administrative orders on vehicle emissions, fuel quality, construction dust and reporting on air quality, and more. This kind of behaviour gives some sign of a more active regulatory regime but there can be no assumption of consistency from the visibility of enforcement. This concern about frequent inspection was repeatedly raised in the field responses as a need not linked to action that takes place only during severe smog events.

Conclusion

The absence of environmental law cannot be the only reason for air pollution in District Multan. Pakistan and Punjab have a significant amount of law, standards, pollution control policies, administrative instructions and monitoring systems targeted at pollution. This study looked at those legal responses from the viewpoint of vehicle users and traffic wardens. The results from the mixed-method evidence suggest that the main challenge is implementation.

There was a high level of awareness among the public of the problem. Thirty out of 32 public respondents identified vehicles as a significant source of pollution, while 100% of respondents considered air pollution as serious or very serious pollution. Recognition of environmental harm has evolved more quickly than awareness of specific government policies, indicating this recognition may be less detailed. A practical challenge was vehicle maintenance, with 17 out of 19 respondents stating high cost as the main issue and 24 out of 31 valid responses stating financial difficulties due to environmental policies.

Most traffic wardens were familiar with the environmental legislation relevant to their role and 15 out of 21 had had some training about smog and vehicle emissions. Limited equipment, staffing pressures, public resistance, workload and administrative or political interference continued to limit the enforcement process. Sixteen officers indicated that they thought the laws were good in theory but were repeatedly separated from how they worked in practice.

Regulatory Enforcement Theory is consistent with the evidence, because the effectiveness of environmental law depends on more than mere prohibition. Monitoring should be credible,

violations should be detectable, enforcement should be consistent and regulated actors should have realistic ways to ensure compliance. The Multan results indicate that there are some weaknesses at every point. There is a need for compliance options at affordable cost for public respondents and for technical equipment, practical training, staffing, coordination, and institutional independence for enforcement officers.

The study is based on District Multan and purposive sampling respondents only. No information was sought on age, gender, education or occupation so it is not possible to make conclusions beyond the profile of the people who completed the questionnaire. Larger samples could be used in future district-level analyses alongside official inspection data, emission-test data and longitudinal air quality data to determine if there is evidence of pollution reduction due to pollution control.

The most effective way to regulate emissions in Multan is to conduct inspections of emissions regularly, with the proper technical equipment, and provide the traffic wardens with proper training. Better cooperation between the environmental authorities, the traffic police, local government and other competent authorities must be complemented with cost-effective compliance mechanisms, and clear enforcement to ensure that the law is increasingly visible in the daily working of the various authorities.

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