

Considering Pollution as a Crime from a Green Criminological and Victimological Perspective

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Abstract:: *Environmental pollution is a pressing global concern that harms humans, the environment, and all living beings, causing significant damage. This paper presents evidence that air pollution is associated with aggressive and violent crime and the criminalisation of air pollution and the formal recognition of its victims through the frameworks of green criminology and green victimology. This paper argues that air pollution causes physical, psychological, and social harm; yet, it is not criminalised and remains underregulated. By building on the concept of harm as central to criminological enquiry, this paper argues for treating air pollution as a crime to ensure accountability and support victims.*

Keywords: Air Pollution, Green Criminology, Green Victimology, Victims.

1. INTRODUCTION

Pollution is one of the most pressing global challenges. The UN Environment Programme estimates that 99% of the world's population lives in areas where air quality surpasses the WHO guidelines. In India, air quality has deteriorated over the past few decades. According to the World Air Quality, India is ranked 3rd in terms of pollution, with an AQI of 238 in 2025.

Pollution victims are not legally recognised or given the necessary attention. For example, in traditional crime, victims are recognised in law and given the required compensation, but those affected by pollution are not. In India, although every citizen has the right to live in a pollution-free environment, the legal framework for criminalising environmental harm, such as pollution, has not yet been established (Reuters, 2024). This paper proposes that air pollution should be criminalised and that its victims should be explicitly acknowledged within the scope of criminology. This study also provides a narrative review of how air pollution contributes to offending. By integrating green criminology and green victimology, this study makes a significant contribution to the argument for acknowledging air pollution as a crime.

2. GREEN CRIMINOLOGY AND GREEN VICTIMOLOGY

In 1990, Lynch coined the term green criminology to address issues related to environmental harm and conduct more specific and enhanced research on environmental harm from a criminological perspective. Stretesky and Lynch (2014) defined green criminology as “a means for studying problems related to environmental harm and crime, victimisation, law, environmental justice, environmental regulation, and moral or philosophical issues as these issues relate to human, non-human animals, plant species, and so on, and the ecosystem and its components”. Green criminologists argue that environmental-related crime and its victims should be considered an integral part of criminology, as this would facilitate more extensive research and provide the necessary support to mitigate the harm caused by environmental-related crimes.

Victims of environmental harm are not aware that they are being victimised and, in some instances, are unaware that they are causing high levels of pollution. When pollutants are exposed to air, the number of victims is significantly high. Although victims of environmental harm, such as pollution, are slowly gaining attention in green criminology, they have not been studied or given the same amount of focus as traditional crime victims. Skinnider (2011) categorised victims of environmental harm based

on the act committed, nature of the harm, magnitude of the damage, and scope of the harm. More comprehensive research can be conducted to gain greater certainty about the harm caused by environmental issues and determine what can be done to rectify the situation and hold those responsible accountable.

Within the framework of green criminology, harm serves as the primary criterion for defining what constitutes a crime. Unlike traditional criminology, which tends to focus strictly on offences that are legally sanctioned, green criminology broadens this scope to include harm often overlooked by laws and policies. For instance, air pollution causes damage comparable to that of traditional crimes, yet it is not criminalised. Emphasising harm shifts the conversation from mere compliance with regulations to acknowledging air pollution as a significant social injustice that impacts both justice and accountability.

Recognising air pollution as a crime enables those affected to be acknowledged as victims rather than passive sufferers. By granting them victim status, they are entitled to rights, including recognition, compensation, participation in legal actions, and access to help programs. Without this recognition, those affected are reduced to mere health statistics rather than victims with rights who deserve justice.

3. AIR POLLUTION AND CRIME

A considerable number of criminology studies have explored the relationship between environmental factors and the occurrence of crime, such as the relationship between seasons and crime patterns (Quetelet, 1842), weather conditions and the occurrence of various crimes (Peng et al., 2011), and how poor air quality, decreased quality of life, and impaired judgement may increase the likelihood of crime occurrence (Ding & Zhai, 2019). This section reviews the association between exposure to pollutants and the occurrence of crime.

4.1. Animals

A study was conducted to determine whether exposure to ultrafine air particles (UAPs) during development or adulthood can cause lasting and sex-specific brain and behavioural problems in mice. The results indicate that even low-level exposure to air pollution can lead to long-term impairments in memory, learning, impulse control, and brain function, highlighting air pollution as a serious and often overlooked risk factor for central nervous system disorders. Both males and females exhibited impaired short-term memory, whereas impulsivity-related behaviours were differentially affected by sex (Allen et al., 2014).

Fonken et al. (2011) investigated the effects of prolonged exposure to particulate matter (PM_{2.5}) at levels commonly found in major urban areas. According to these findings, chronic exposure to PM_{2.5} may impair cognition and emotional regulation by inducing inflammation and altering brain structure. Compared to mice breathing filtered air, those exposed to PM_{2.5} exhibited more depression-like behaviours, poorer spatial learning and memory, and signs of brain inflammation in the hippocampus.

Yokota et al. (2013) focused on the effects of inhalation of diesel exhaust (DE) in pregnant mice. The results showed that DE-exposed mice exhibited worse

motor skills, were more impulsive in stressful situations, and displayed significant changes in brain chemicals, including dopamine, noradrenaline, and serotonin, in key brain regions, such as the cerebellum, hypothalamus, prefrontal cortex, and amygdala. These findings suggest that when mothers inhale DE, it can affect the development of their babies' brains, leading to long-lasting behavioural and chemical changes. This indicates that diesel exhaust poses a significant environmental risk to brain health.

4.2. Children

Haynes et al. (2011) examined whether air pollution from metals and fine particles is linked to criminal behaviour among young people in Ohio. The researchers used data on emissions, local population demographics, and court cases. They found that higher levels of manganese, mercury, and small particles of pollutants were associated with a greater likelihood of adjudicating young people for crimes. Exposure to pollutants such as PM_{2.5}, O₃, and NO₂ increases the likelihood of committing a felony, thereby putting youth at risk of developing delinquent behaviour (Sarmiento, 2020; Haynes et al., 2011).

In children, exposure to lead seems to have neurological effects that contribute to behavioural issues, lower IQ, and learning deficits. Needleman et al. (2002) reported a relationship between exposure to lead and aggressive and delinquent behaviours. Another longitudinal study examined the relationship between lead exposure and behavioural outcomes and found that exposure is associated with antisocial behaviour in children and adults (Dietrich et al., 2001).

4.3. Adult

Monoamines are neurotransmitters, including serotonin, dopamine, and norepinephrine (also known as noradrenaline). These hormones play a significant role in the body and their levels vary, impacting the entire body. Serotonin is the key hormone that stabilises mood, feelings of well-being, and happiness. Experimental studies investigating the association between air pollution and aggressive behaviour have also shown that pollutants affect brain chemistry by lowering the serotonin levels (Gonzalez-Guevara et al., 2014). This, in turn, increases aggression and impulsivity in adults, children, and animals.

Berman et al. (2019) conducted a study using daily air quality data from 301 counties in 34 states for ozone and PM_{2.5}, as well as daily crime records from the FBI. The study was conducted in the U.S. from 2000 to 2013. The results showed that short-term increases in air pollution, specifically fine particles (PM_{2.5}) and ozone, were associated with higher rates of violent crime. When PM_{2.5} levels rise by 10 µg/m³, the likelihood of violent crime increases by approximately 1.17%, and a 10 ppb increase in ozone increases the risk by 0.59%. The study found no correlation between pollution and property crime. The connection between air pollution and violent crime appears to involve the effect of exposure to PM_{2.5}, which influences aggressive behaviour and impulsivity, leading to assault (Pardoe, 2020; Burkhardt et al., 2020). Additionally, the study found no relationship between air pollution and non-violent crimes such as property crimes. Data collected over 14 years in the United States were used to evaluate the association between PM_{2.5} and ozone levels and the crime

types. These findings suggest a heightened risk of violent crime associated with the presence of pollutants.

Sarmiento (2020) compared two types of violations—aggregated and non-aggregated assaults—and two property crimes, robbery, and larceny. The results demonstrate that pollution seems to influence criminal behaviour. Another longitudinal study, using a broader dataset spanning multiple U.S. counties, analysed daily fluctuations in pollution (ozone and PM_{2.5}) and crime counts from 2000 to 2013. It estimates a general contemporaneous relationship between air pollution and crime, highlighting consistent increases in violent crime but not in property crime (Bondy et al., 2020). A study found that exposure to secondary cigarette smoke increased aggression in both angered and no angered participants. Using a noise-based aggression test, Jones and Bogat (1978) found that individuals exposed to smoke exhibited more aggressive behaviour than those exposed to clean air.

Ding and Zhai (2019) investigated the relationship between air quality and bus pickpocketing in cities and found a strong link between poor air quality, as measured by AQI and PM_{2.5}, and an increase in pickpocketing incidents. They used a machine learning model (SVM) to predict the daily pickpocketing risk with 81% accuracy. This study suggests that monitoring air quality can help prevent and predict bus pickpocketing, providing valuable tools for police crime prevention. By applying Crime Pattern Theory and Rational Choice Theory, Ding and Zhai (2019) explained how poor air quality can influence decision-making and routine activities, thereby increasing the likelihood of opportunistic crimes such as pickpocketing. This section reviews the association between prolonged exposure to pollutants and crime using empirical studies conducted on animals, children, and adults.

5. LEGAL MECHANISMS AND VICTIM REDRESS

India's approach to combating air pollution rests on a combination of national programs, sector-specific controls, and public engagement measures. One of the major air pollution incidents in India was the Bhopal gas tragedy, which prompted the enactment of the Environmental Protection Act, 1986, which serves as the umbrella legislation for environmental protection in India. The Act empowers the central government to take all necessary measures to protect the environment and establish measures to prevent, control, and abate pollution. The Act also incorporates fines, imprisonment for up to five years, or both for violations of the Act. The Act also extends liability to companies, industries, and other actors responsible for environmental violations. Although these laws make pollution illegal in India, it is largely viewed as regulatory compliance rather than a crime that causes large-scale victimisation requiring justice and redressal.

The Air (Prevention and Control of Pollution) Act, 1981, specifically addresses air pollution in India. The act established the Central Pollution Control Board (CPCB) and State Pollution Control Boards (SPCBs) as the primary regulatory agencies to monitor and control air pollution. India's National Environment Policy (2006) provides broader policy guidance by outlining strategic yet non-binding environmental goals. A multi-tiered structure authorises the enforcement of air pollution control

measures. At the national level, the Central Pollution Control Board (CPCB) under the MoEFCC establishes National Ambient Air Quality Standards (NAAQS), sets emission limits for industries and vehicles, and oversees air quality through the National Air Quality Monitoring Program (NAMP). State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs) enforce emission standards and regulate industries at the state level, utilising the Consent to Establish (CTE) and Consent to Operate (CTO) mechanisms. Additionally, they take action against violators, with the Tamil Nadu Pollution Control Board (TNPCB) operating Continuous Ambient Air Quality Monitoring Stations (CAAQMS) and enforcing state-specific norms. India's National Green Tribunal (NGT) is the primary environmental court, established under the NGT Act of 2010. The NGT awards compensation and orders environmental restoration and remedial measures in cases, applying principles such as the Polluter Pays Principle and the Precautionary Principle.

5.1. Victim Assistance Mechanisms and redressal pathways

Victim assistance for those affected by air pollution in India is fragmented and indirect compared to the mechanisms available for victims of violent crimes or natural disasters. However, several legal, administrative, and financial avenues are available. Judicial remedies play a central role, with the National Green Tribunal (NGT) applying the Polluter Pays and Precautionary Principles to award compensation and mandate clean-up measures, as seen in cases in which villagers in Tamil Nadu received restitution for industrial emissions (NGT 2023).

In India, multiple redressal pathways exist to address air pollution, although their scope and effectiveness vary. The National Green Tribunal (NGT) serves as a fast-track legal body for environmental cases, applying the principles of justice and compensation. Simultaneously, the High Courts and Supreme Court intervened through public interest litigations (PILs) and constitutional petitions to mandate stronger protections. The Central Pollution Control Board (CPCB) operates the SAMEER App and online portals to track air quality and receive complaints. Simultaneously, State Pollution Control Boards (SPCBs) regulate emissions and address grievances at the state level. Region-specific bodies, such as the Commission for Air Quality Management (CAQM), focus on urgent cross-state issues in the National Capital Region. Simultaneously, national portals such as CPGRAMS allow citizens to lodge environmental grievances.

6. CONCLUSION AND RECOMMENDATION

With climate change and environmental degradation, considerable effort must be invested in understanding crime by studying its impact, as well as in taking the necessary proactive steps to address it. Despite the availability of platforms for lodging grievances, India continues to face significant challenges in the reporting and documentation of air pollution complaints. A key concern is that many complaints go unreported because of a lack of awareness, mistrust of institutions, or fear of reprisal. To curb pollution, it is essential to provide separate statistics on air and water pollution, enabling researchers to take the necessary steps and prioritise actions accordingly. When

pollution is not deemed a serious offence, people tend to violate rules that are not only for the environment but also for people themselves, both physiologically and psychologically. Considering pollution a crime can lead to stricter policies and regulations that help reduce pollution from anthropogenic sources. Implementing strict rules will lead people to follow set regulations, which, in turn, will reduce the issues caused by green crime. This is a narrative synthesis, and to gain a deeper insight, further studies can be conducted using meta-analysis, systematic reviews, or empirical analysis.

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