

## Towards Environmental Justice: Evaluating Environmental Law in Pakistan

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### Abstract

Environmental degradation is a pressing issue globally, and Pakistan is no exception. Environmental degradation poses a significant threat to Pakistan's ecosystems, public health, and sustainable development. The quest for environmental justice in Pakistan is imperative given the country's myriad environmental challenges. This paper undertakes a comprehensive evaluation of Pakistan's environmental laws and their efficacy in achieving environmental justice. Through a multidimensional analysis encompassing legal frameworks, case studies, and scholarly discourse, the study delineates the strengths, weaknesses, and areas for improvement in Pakistan's environmental legal regime. Key recommendations are proposed to fortify environmental law enforcement and promote sustainable development in Pakistan.

**Keywords:** Environmental Justice, Environmental Law, Legal Framework and Enforcement in Pakistan, Sustainability.

### 1. INTRODUCTION

Environmental degradation poses a significant threat to Pakistan's socio-economic development and public health. With rapid urbanization, industrialization, and population growth, the country faces myriad environmental challenges, including air and water pollution, deforestation, habitat destruction, and climate change impacts. These challenges not only undermine the well-being of Pakistan's citizens but also jeopardize the country's ecological integrity and sustainable future.

Against this backdrop, the pursuit of environmental justice has emerged as a pressing imperative for Pakistan. Environmental justice, as defined by the United Nations (UNFCCC, UNDRIP, Rio Declaration, and SDGs), encompasses the fair distribution of environmental benefits and burdens, equitable access to natural resources, and the right to a healthy and sustainable environment for all (Ahmed et al., 2020).

In Pakistan, the lack of comprehensive legal frameworks, weak enforcement mechanisms, and limited stakeholder engagement pose significant barriers to achieving environmental justice. This situation exacerbates environmental challenges and undermines the rights of marginalized communities. Unequal access to resources, unsustainable development practices, and unchecked environmental risks further perpetuate injustices. Without concerted efforts from policymakers, regulatory agencies, civil society, and the public, systemic inequalities and environmental degradation will persist, hindering progress towards social equity and ecological integrity. This paper seeks to undertake a comprehensive evaluation of Pakistan's environmental laws and their efficacy in advancing environmental justice. By analyzing the evolution, scope, and implementation of environmental legislation, as well as identifying key challenges and opportunities, this study aims to provide insights into the state of environmental governance in Pakistan and offer recommendations for policy reform and institutional strengthening (Ittefaq & Kamboh, 2024).

### 2. METHODOLOGY

The research methodology employed in this study utilizes content analysis as the principal approach for data collection and analysis. Initially, a diverse array of documents, including environmental laws, policy documents, academic articles, and NGO reports pertaining to environmental law and justice in Pakistan, are compiled. These documents serve as the primary sources of qualitative data. Subsequently, a systematic coding process is undertaken to categorize the content of the documents according to predefined themes or categories relevant to the research objectives. This involves identifying key information, quotes, or excerpts from the documents and assigning them to specific codes. Following the coding process, the data are analyzed to uncover recurring patterns, themes, and trends. The analysis aims to distill meaningful insights and

findings regarding environmental law and justice issues in Pakistan. Throughout the research, measures are taken to ensure the reliability and validity of the findings, including inter-coder reliability checks and triangulation of data sources. Overall, content analysis offers a robust and systematic approach to examining qualitative data, providing valuable insights into the research topic.

### 3. LITERATURE REVIEW

The literature on environmental law and justice in Pakistan highlights the challenges faced by regulatory frameworks in addressing environmental degradation and ensuring equitable outcomes. Studies often examine the effectiveness of existing policies, the role of stakeholders in decision-making processes, and the impact of environmental degradation on marginalized communities. By synthesizing key findings and identifying gaps in research, this review aims to contribute to a deeper understanding of environmental justice issues and inform future interventions in Pakistan.

Usman and Abbasi (2019) explore the challenges faced by indigenous communities in Pakistan regarding environmental justice. They identify several problems, including the lack of recognition of indigenous land rights, inadequate consultation processes in decision-making regarding natural resource extraction projects, and the disproportionate impact of environmental degradation on indigenous communities' livelihoods and cultural heritage. Their study underscores the marginalized position of indigenous communities in environmental governance and the need for legal reforms to address their rights and concerns effectively. Suggestions include enhancing indigenous participation in environmental decision-making, recognizing and protecting indigenous land rights, and ensuring equitable distribution of benefits from natural resource exploitation. Additionally, the study advocates for the incorporation of indigenous knowledge and practices into environmental policies and fostering partnerships between government agencies, NGOs, and indigenous representatives to promote environmental justice and sustainable development in Pakistan.

Shah and Hussain (2020) explore environmental jurisprudence and access to justice in Pakistan from a comparative perspective. They discuss various problems related to the enforcement of environmental laws, including inadequate access to justice, procedural complexities, and institutional inefficiencies. Through comparative analysis, the researchers identify challenges such as limited legal aid services, delays in court proceedings, and disparities in legal representation among different socio-economic groups. The findings emphasize the need for reforms to enhance access to justice, streamline legal procedures, and strengthen enforcement mechanisms. Suggestions offered include the establishment of specialized environmental courts, provision of legal aid services for marginalized communities, and capacity-building initiatives for legal professionals and judicial officers. Overall, the study contributes valuable insights to the discourse on environmental justice and legal reforms in Pakistan.

Saleem and Khan (2019) discuss challenges concerning environmental protection and the rule of law in Pakistan, focusing on weak enforcement of regulations and deficiencies in legal frameworks. Their findings highlight widespread disregard for environmental laws. They suggest strengthening legal mechanisms, enhancing regulatory oversight, and promoting environmental compliance through public awareness campaigns. Their study emphasizes the urgent need for robust legal measures to address environmental degradation in Pakistan.

Khan and Qureshi (2018) conduct a comparative study of Pakistan's legal framework concerning environmental rights and access to justice. They discuss problems such as limited access to legal remedies for environmental grievances, inadequate enforcement of environmental laws, and disparities in the application of environmental justice among different socio-economic groups. Their findings underscore the need for reforms to ensure equitable access to environmental justice, strengthen legal mechanisms for environmental protection, and enhance accountability for environmental violations. They suggest improving public awareness of environmental rights, empowering marginalized communities to participate in environmental decision-making processes, and enhancing the capacity of judicial institutions to adjudicate environmental disputes effectively.

Danish and Malik (2017) analyze the challenges of environmental justice in Pakistan from a legal perspective. They identify problems such as inadequate enforcement of environmental laws, weak regulatory mechanisms, and limited access to legal remedies for environmental grievances. Findings highlight the disparities in environmental justice, particularly affecting marginalized communities and vulnerable populations. The study emphasizes the importance of strengthening legal frameworks, enhancing institutional capacity for environmental governance, and promoting public participation in environmental decision-making processes. They suggest reforms to improve enforcement mechanisms, increase transparency and accountability in environmental governance, and enhance access to legal assistance for environmental issues. Overall, the research contributes valuable insights into the complexities of environmental justice in Pakistan and underscores the need for comprehensive legal reforms to address environmental challenges effectively.

In short, the literature review reveals a complex landscape of environmental law and justice issues in Pakistan, encompassing challenges such as weak enforcement mechanisms, disparities in access to justice, and deficiencies in legal frameworks. Despite these challenges, the studies provide valuable insights and recommendations for addressing environmental degradation, promoting sustainable development, and ensuring equitable access to environmental justice in Pakistan. Moving forward, policymakers, stakeholders, and civil society actors must work collaboratively to implement these recommendations, strengthen regulatory mechanisms, and foster a culture of environmental compliance to mitigate environmental risks and safeguard the well-being of present and future generations.

### 4. OVERVIEW OF THE HISTORICAL EVOLUTION OF ENVIRONMENTAL LAWS IN PAKISTAN

The historical evolution of environmental law in Pakistan reflects a journey marked by significant legislative developments and milestones, shaped by both colonial legacies and indigenous efforts to address emerging environmental challenges. This

overview will explore key phases in the evolution of environmental law in Pakistan, spanning from the colonial era to the present day (Urooj, 2015).

#### **4.1 Colonial Legacy and Pre-Independence Era (1858-1947)**

During the colonial period, British rule in the Indian subcontinent laid the groundwork for environmental regulation, primarily focused on resource extraction and revenue generation. The colonial administration enacted laws to manage forests, regulate water resources, and control wildlife, often prioritizing imperial interests over environmental conservation.

One of the earliest environmental laws in British India was the Indian Forest Act of 1865, which aimed to regulate forest management and revenue collection. This legislation was subsequently revised in 1878 and 1927, reflecting evolving colonial policies on forest administration and exploitation.

Similarly, the construction of irrigation canals and dams under British rule led to the enactment of laws governing water management, such as the Punjab Irrigation Act of 1887. These laws facilitated agricultural expansion but also laid the groundwork for subsequent water disputes and environmental degradation (Bandyopadhyay, 2017).

#### **4.2 Post-Independence Period (1947-1970s)**

Following Pakistan's independence in 1947, environmental concerns began to receive attention as the new nation grappled with the challenges of nation-building and economic development. Early legislative initiatives focused on forestry, wildlife protection, and water management, reflecting the country's agrarian economy and reliance on natural resources.

In 1948, Pakistan enacted the West Pakistan Forest Act 1948, which aimed to regulate forest management and prevent deforestation. Subsequent legislation, such as the Punjab Wildlife Protection Act of 1972, sought to conserve biodiversity and protect endangered species (the Punjab Wildlife Protection Act, 1972).

#### **4.3 Emergence of Environmental Consciousness (1980s-1990s)**

The 1980s witnessed a growing awareness of environmental issues globally, prompting Pakistan to take steps to address environmental degradation and pollution. In 1983, the Pakistan Environmental Protection Ordinance (PEPO) 1983 was promulgated, establishing the legal framework for environmental protection and conservation.

The establishment of the Pakistan Environmental Protection Agency (EPA) in 1984 under PEPO of 1983 marked a significant milestone in environmental governance, providing a dedicated institution for enforcing environmental laws and regulations. The EPA played a key role in monitoring pollution, conducting environmental impact assessments (EIA), and promoting environmental awareness and education (PEPO, 1983).

#### **4.4 Modern Environmental Legislation (2000s-Present)**

In recent decades, Pakistan has enacted several environmental laws and regulations to address emerging challenges such as air and water pollution, solid waste management, and climate change. The Pakistan Environmental Protection Act (PEPA) of 1997 was revised and strengthened in 2012 to enhance enforcement mechanisms and expand the scope of environmental regulation (PEPA Amendment, 2012).

Pakistan has demonstrated its commitment to global environmental governance by ratifying several international agreements and conventions. Among these, the Paris Agreement on climate change stands out, ratified by Pakistan on November 10, 2016. By becoming a party to this landmark accord, Pakistan pledged to contribute to global efforts to mitigate greenhouse gas emissions and limit the rise in global temperatures.

Additionally, Pakistan ratified the Convention on Biological Diversity on July 15, 1994, signaling its dedication to conserving biological diversity, promoting sustainable use of natural resources, and ensuring equitable sharing of benefits derived from genetic resources. This commitment underscores Pakistan's recognition of the interconnectedness between biodiversity conservation, sustainable development, and human well-being.

These ratifications reflect Pakistan's acknowledgment of the urgency of addressing Transboundary environmental challenges and its willingness to cooperate with the international community to achieve shared environmental goals. By aligning its national policies and strategies with these international agreements, Pakistan aims to contribute meaningfully to global efforts to safeguard the environment and secure a sustainable future for present and future generations.

### **5. CONTEMPORARY ENVIRONMENTAL LEGISLATION: THE ROLE OF PEPA (1997) FOR ENVIRONMENTAL PROTECTION IN PAKISTAN**

The PEPA 1997 stands as the key legislation governing environmental protection in Pakistan. It forms the foundation for conservation efforts nationwide. In addition to PEPA of 1997, supplementary regulations and policies, such as the EIA Regulations (2000) and the National Environmental Quality Standards (NEQS) (2000), further bolster its implementation, ensuring a comprehensive approach to environmental management. Together, these legal frameworks outline measures for pollution control, sustainable development promotion, and adherence to environmental standards. PEPA 1997, as the cornerstone legislation, plays a pivotal role in guiding environmental governance in Pakistan, steering efforts towards conservation and preservation while addressing emerging environmental challenges.

#### **5.1 Pakistan Environmental Protection Act (PEPA) 1997**

The PEPA, 1997 serves as a pivotal legislation dictating the legal contours of environmental protection and conservation efforts within the country. Enacted in 1997, PEPA empowers both federal and provincial authorities to implement a wide array of measures aimed at curbing environmental pollution, promoting sustainable development practices, and ensuring adherence to established environmental standards and guidelines. Through PEPA, Pakistan endeavors to address various

environmental challenges, including air and water pollution, deforestation, and habitat degradation, while simultaneously striving to foster ecological resilience and enhance environmental quality (PEPA, 1997).

Under PEPA, regulatory agencies are tasked with monitoring and enforcing compliance with environmental regulations, conducting EIAs for development projects, and spearheading initiatives to rehabilitate degraded ecosystems. Furthermore, PEPA provides a legal framework for public participation in environmental decision-making processes, allowing for greater transparency and accountability in environmental governance (Shafi & Siddiqui, 2018).

As Pakistan grapples with the complex interplay between economic development and environmental sustainability, PEPA remains a cornerstone legislation guiding the nation's environmental policies and practices. Its provisions lay the groundwork for concerted efforts to protect and preserve Pakistan's natural heritage for present and future generations.

Key provisions of PEPA include:

**1. Environmental Quality Standards (EQS):** EQS in Pakistan are established under Section 6 of the PEPA of 1997. This section empowers the federal and provincial governments, as well as environmental protection agencies, to set standards for various pollutants in air, water, soil, and noise. It outlines the authority and responsibility of regulatory bodies to define permissible limits for pollutants to protect human health and the environment. Additionally, Section 6 of PEPA 1997 mandates periodic review and revision of EQS to ensure alignment with scientific advancements, technological progress, and emerging environmental challenges. By providing a legal framework for the establishment of EQS, PEPA 1997 facilitates effective monitoring and regulation of pollution levels across different industries and sectors, thereby promoting environmental sustainability and public health (PEPA, 1997).

**2. Environmental Impact Assessment (EIA):** EIA is a statutory requirement under Section 12 of the PEPA of 1997. This provision mandates the preparation of EIAs for proposed development projects that are likely to have significant adverse effects on the environment. EIAs serve as a systematic process for evaluating the potential environmental consequences of proposed activities, helping to identify, predict, and mitigate adverse impacts before project implementation. By incorporating environmental considerations into decision-making processes, EIA promotes sustainable development practices and ensures the protection of natural resources and ecosystems ((Hameed & Malik, 2019).

**3. Pollution Control Measures:** Pollution control measures are established under Section 16 of the PEPA of 1997. This section grants the government the authority to prescribe pollution control measures and standards for various sources of pollution, including industries, vehicles, and other activities. It empowers environmental authorities to issue directives, orders, and prohibitions aimed at preventing and mitigating environmental pollution.

Section 16 of PEPA delineates the responsibilities of the federal and provincial governments in formulating and implementing pollution control measures. It mandates the establishment of emission standards, effluent standards, and other regulatory requirements to limit the release of pollutants into the environment. Additionally, this section provides mechanisms for monitoring compliance with pollution control standards and taking enforcement actions against violators.

Furthermore, Section 16 authorizes environmental authorities to issue directives to industries, requiring them to adopt pollution prevention and control technologies, implement pollution abatement measures, and comply with prescribed environmental standards. These directives may include requirements for installing pollution control equipment, conducting environmental audits, and submitting periodic reports on pollution abatement efforts (PEPA, 1997).

Overall, Section 16 of PEPA 1997 plays a pivotal role in regulating pollution and promoting environmental sustainability by empowering authorities to enforce pollution control measures effectively and hold polluters accountable for their actions (Shafi & Siddiqui, 2018).

**4. Environmental Protection Agency (EPA):** The establishment of federal and provincial Environmental Protection Agencies (EPAs) is outlined under Section 3 of the PEPA of 1997. This section delineates the creation and functions of EPAs at both the federal and provincial levels, assigning them responsibilities for implementing and enforcing environmental laws and regulations. EPAs are entrusted with tasks such as monitoring pollution levels, conducting inspections of industrial facilities, investigating environmental violations, and taking enforcement actions against individuals or entities found to be in breach of environmental standards. Through their regulatory oversight and enforcement efforts, EPAs play a critical role in safeguarding environmental quality and promoting sustainable development (Hameed & Malik, 2019).

**5. Public Participation:** PEPA 1997 promotes public participation in environmental decision-making by requiring public consultation and involvement in the EIA process and other environmental assessments. Section 12 of PEPA specifically outlines the provisions for public consultation, ensuring that stakeholders have the opportunity to voice their concerns and contribute to decision-making processes related to proposed development projects. By encouraging transparency, accountability, and community engagement, PEPA 1997 aims to enhance the effectiveness and legitimacy of environmental governance in Pakistan. This provision underscores the importance of incorporating diverse perspectives and local knowledge into environmental decision-making processes, ultimately fostering more sustainable and inclusive development outcomes (Ahmad & Khan, 2018).

## 5.2 Related Regulations and Policies for Environmental Protection in Pakistan

In addition to PEPA, several regulations and policies complement the legal framework for environmental protection in Pakistan. These include:

**1. National Environmental Quality Standards (NEQS):** The NEQS were established in Pakistan on December 29, 1997, under the provisions of the PEPA 1997. These standards prescribe specific criteria and guidelines for various pollutants, emissions, and effluents to ensure compliance with the environmental quality standards set forth by PEPA. NEQS serve as benchmarks for monitoring and controlling pollution levels across different sectors, providing regulatory authorities, industries, and other stakeholders with clear parameters for environmental performance. Through the

establishment of NEQS, Pakistan aims to safeguard environmental quality, protect public health, and promote sustainable development nationwide (Hussain & Khan, 2019).

**2. Environmental Standards and Guidelines:** Various regulations and guidelines addressing specific environmental issues such as industrial pollution, waste management, hazardous substances, and noise pollution were established under the provisions of the PEPA of 1997. These regulations and guidelines were enacted to complement the overarching framework provided by PEPA and ensure comprehensive coverage of environmental management and conservation efforts in Pakistan. Some examples of these regulations include the Hazardous Substances Rules, the Noise Pollution Rules, and the NEQS. Each of these regulations specifies technical standards, requirements, and procedures aimed at controlling and mitigating environmental impacts associated with different activities and pollutants. The implementation of these regulations is crucial for ensuring environmental protection and sustainable development in Pakistan, aligning with the broader objectives outlined in PEPA and international environmental agreements ratified by the country (Ahmad & Khan, 2018).

**3. Environmental Policy:** Pakistan's National Environmental Policy, established under the PEPA of 1997, delineates the government's strategy and priorities for environmental management and sustainable development. It accentuates the imperative of incorporating environmental considerations into sectoral policies and plans to realize environmental sustainability goals. The policy underscores the need for holistic approaches to address environmental challenges effectively, including pollution reduction, resource conservation, and habitat preservation. By integrating environmental concerns into various sectors such as agriculture, industry, and urban development, the policy seeks to foster a harmonious balance between economic growth and environmental protection. Moreover, it advocates for stakeholder engagement, public participation, and international collaboration to enhance environmental governance and achieve shared sustainability objectives. Through its comprehensive framework, the National Environmental Policy aims to guide policy-makers, practitioners, and stakeholders in fostering a resilient and environmentally conscious society in Pakistan (Zubair & Malik, 2020).

**4. International Agreements:** Pakistan has ratified several international environmental agreements and conventions, including the Kyoto Protocol, the Montreal Protocol, and the Basel Convention, committing to implementing measures to address pressing environmental challenges. The country ratified the Kyoto Protocol in 2005, pledging to reduce greenhouse gas emissions and mitigate climate change impacts. Similarly, it ratified the Montreal Protocol in 1992, committing to phasing out ozone-depleting substances to safeguard the ozone layer and mitigate environmental degradation. Additionally, Pakistan ratified the Basel Convention in 1994, undertaking responsibilities to manage and regulate the Transboundary movement of hazardous wastes and ensure environmentally sound waste management practices (UNDP, 2020).

These international agreements underscore Pakistan's commitment to global environmental governance and highlight its efforts to align with international standards for environmental protection and sustainability. By ratifying these conventions, Pakistan demonstrates its willingness to collaborate with the international community in addressing environmental challenges and advancing collective efforts towards a more sustainable future.

The legal framework for environmental protection in Pakistan, anchored by the PEPA, provides the foundation for addressing environmental challenges and promoting sustainable development. However, effective implementation, enforcement, and compliance are essential to realize the objectives of environmental legislation and ensure the protection of the environment and public health (Ali, 2007).

### 5.3 The Enforcement Mechanisms and Institutional Arrangements for Environmental Governance in Pakistan

In Pakistan, the enforcement mechanisms and institutional arrangements for environmental governance play a crucial role in ensuring compliance with environmental laws and regulations, as well as in monitoring and addressing environmental challenges effectively. The regulatory framework is supported by various agencies and monitoring systems responsible for oversight, enforcement, and implementation of environmental policies and laws (Ali, 2007). Details of the regulatory agencies are given in the following paragraphs.

#### 5.3.1 Regulatory Agencies

Environmental regulatory agencies in Pakistan play a pivotal role in overseeing and enforcing environmental laws and regulations to safeguard the country's natural resources and mitigate environmental risks. These agencies are tasked with monitoring pollution levels, enforcing environmental standards, and promoting sustainable development practices across various industries and sectors. Through their regulatory oversight and enforcement mechanisms, they aim to protect public health, preserve ecosystems, and promote environmental sustainability in Pakistan.

**5.3.1.1 Federal Environmental Protection Agency (EPA):** The EPA was established under the PEPA of 1997. The EPA became operational on 1997 to enforce environmental laws, grant permits, conduct inspections, and oversee environmental assessments for development projects. Additionally, it plays a crucial role in developing national environmental policies and standards to ensure compliance with regulatory requirements and promote sustainable environmental management practices across the country. As the primary regulatory body at the federal level, the EPA plays a pivotal role in safeguarding environmental quality, fostering sustainable development, and addressing environmental challenges nationwide. Its establishment marked a significant milestone in Pakistan's environmental governance framework, reflecting the country's commitment to effective environmental management and conservation (Ehtasham et al., 2022).

#### 5.3.1.2 Provincial Environmental Protection Agencies (EPAs)

Each province in Pakistan has its own EPA, established to enforce environmental laws and regulations within its jurisdiction. These agencies operate in coordination with the Federal EPA and are responsible for monitoring pollution levels,

conducting inspections, and implementing environmental protection measures at the provincial level. The formation of provincial EPAs varied across provinces, with each agency established at different times in response to evolving environmental concerns and administrative needs (Nazir, 2004).

The Punjab Environmental Protection Agency (PEPA) was established in 1997 under the Punjab Environmental Protection Act. Similarly, the Sindh Environmental Protection Agency (SEPA) was formed in 1994 under the Sindh Environmental Protection Ordinance. In Khyber Pakhtunkhwa, the Khyber Pakhtunkhwa Environmental Protection Agency (KP-EPA) was established in 2014 under the Khyber Pakhtunkhwa Environmental Protection Act. Likewise, the Baluchistan Environmental Protection Agency (BEPA) was established in 2012 under the Baluchistan Environmental Protection Act.

These provincial EPAs play a vital role in environmental governance, complementing the efforts of the Federal EPA and addressing region-specific environmental challenges. Through their enforcement actions and regulatory initiatives, provincial EPAs contribute to the overall protection and conservation of the environment in Pakistan (Nadeem & Hameed, 2008).

**5.3.1.3 Ministry of Climate Change:** The Ministry of Climate Change serves as the apex federal body responsible for formulating and implementing environmental policies, strategies, and initiatives in Pakistan. Established in 2014, the ministry plays a pivotal role in coordinating and overseeing environmental governance at the federal level. It collaborates closely with the Federal Environmental Protection Agency (EPA) to address pressing environmental challenges such as climate change, biodiversity conservation, and natural resource management (Javed, 2016).

The ministry's mandate encompasses a wide range of environmental issues, including air and water quality, land degradation, deforestation, and waste management. It leads efforts to mainstream climate change adaptation and mitigation measures into national development plans and policies, promoting sustainable practices across various sectors. Additionally, the ministry fosters partnerships with international organizations, civil society groups, and other stakeholders to mobilize resources and expertise for environmental conservation and sustainable development initiatives nationwide. Through its proactive approach and strategic interventions, the Ministry of Climate Change plays a crucial role in advancing environmental protection and sustainability objectives in Pakistan (Javed, 2016).

## 5.4 Monitoring Systems

Environmental monitoring systems in Pakistan are critical for assessing the condition of the environment and ensuring compliance with environmental regulations. These systems utilize a variety of tools and technologies to measure air and water quality, monitor biodiversity, and detect changes in environmental parameters. By collecting and analyzing environmental data, these systems help authorities make informed decisions to protect ecosystems, manage natural resources effectively, and address environmental challenges proactively.

**5.4.1 Environmental Monitoring Networks:** Pakistan has established environmental monitoring networks to track pollution levels and assess environmental quality across the country. These networks include air quality monitoring stations, water quality monitoring stations, and soil monitoring programs that collect data on various pollutants and parameters. The establishment of these monitoring networks began in the late 20th century and has since expanded, with ongoing efforts to enhance coverage and capabilities. These networks play a crucial role in identifying pollution hotspots, evaluating the effectiveness of pollution control measures, and informing decision-making processes aimed at safeguarding public health and the environment (Shi et al., 2020).

**5.4.2 Environmental Impact Assessment (EIA) Process:** The EIA process serves as a monitoring mechanism for proposed development projects to assess their potential environmental impacts and recommend mitigation measures. EIAs are typically conducted by project proponents or consultants and are reviewed by regulatory agencies to ensure compliance with environmental standards and regulations. The formal incorporation of EIAs into environmental decision-making processes began in Pakistan with the enactment of the PEPA of 1997, which mandated the preparation of EIAs for projects likely to have significant adverse effects on the environment (Imran et al., 2023). Since then, EIAs have become an integral part of the development approval process, providing valuable insights into potential environmental risks and guiding sustainable project planning and implementation (Khan et al., 2022).

**1. Compliance and Enforcement Mechanisms:** Regulatory agencies (Federal EPA, provincial EPAs) in Pakistan employ various compliance and enforcement mechanisms to ensure adherence to environmental laws and regulations. These mechanisms include regular inspections of industrial facilities, audits of environmental management systems, and the imposition of penalties for non-compliance with environmental standards. Additionally, regulatory agencies have the authority to take legal actions against violators, including issuing fines, revoking permits, and initiating legal proceedings. Furthermore, these agencies collaborate closely with law enforcement authorities to address environmental crimes such as illegal waste dumping, pollution of water bodies, and destruction of natural habitats. By coordinating efforts with law enforcement agencies, regulatory bodies can effectively investigate environmental offenses, gather evidence, and prosecute offenders in accordance with the law. This collaborative approach strengthens the enforcement of environmental regulations and contributes to the protection of the environment and public health (Jamil & Awan, 2020).

**2. Public Participation and Civil Society Oversight:** Public participation and civil society oversight are crucial components of environmental governance in Pakistan. Organisations such as the Pakistan Environmental Protection Foundation (PEPF), Sustainable Development Policy Institute (SDPI), and World Wide Fund for Nature - Pakistan (WWF-Pakistan) actively engage in advocacy, awareness-raising, and monitoring of environmental policies and practices. These groups work to hold regulatory agencies and polluters accountable for environmental degradation and advocate for sustainable solutions to pressing environmental challenges. Through research, education campaigns, and community

outreach initiatives, these organizations empower citizens to participate in decision-making processes related to environmental issues and contribute to fostering a culture of environmental responsibility and stewardship in Pakistan (Shahbaz & Khan, 2019).

### **5.5 Challenges and Barriers to Effective Enforcement of Environmental Laws in Pakistan**

Enforcement of environmental laws in Pakistan faces numerous challenges and barriers, stemming from institutional weaknesses, resource constraints, regulatory gaps, and socio-economic factors. Drawing on empirical evidence and stakeholder perspectives, this section identifies key challenges and barriers to effective enforcement of environmental laws in Pakistan (Haider, 2024).

#### **5.5.1 Institutional Weaknesses**

One of the significant challenges facing environmental enforcement in Pakistan is the lack of coordination among regulatory agencies. This fragmentation and overlap in mandates often result in inefficiencies and gaps in enforcement efforts, hindering effective environmental governance. Additionally, regulatory agencies suffer from inadequate institutional capacity, lacking essential human, financial, and technical resources necessary for enforcement activities. Limited staffing, training, and equipment further impede their ability to conduct inspections, monitor compliance, and take enforcement actions effectively (Nadeem & Hameed, 2008).

Moreover, corruption and political interference pose significant obstacles to environmental enforcement in the country. Instances of bribery, nepotism, and influence-peddling can compromise regulatory decisions, undermine enforcement actions, and erode accountability mechanisms. These institutional weaknesses not only impede the effective implementation of environmental laws but also erode public trust in regulatory institutions and their ability to address environmental challenges. Addressing these challenges requires concerted efforts to enhance coordination among regulatory agencies, bolster institutional capacity, and combat corruption and political interference in environmental governance (Nadeem & Hameed, 2008).

#### **5.5.2 Resource Constraints**

Resource constraints pose significant challenges to environmental enforcement in Pakistan. Budgetary constraints limit the funding available for environmental agencies and enforcement activities, affecting their capacity to carry out essential tasks such as monitoring, inspections, and enforcement actions. With limited resources, agencies struggle to conduct comprehensive monitoring, enforce regulations effectively, and respond promptly to environmental violations. Moreover, budget cuts and competing priorities further strain resources, diverting attention and funding away from environmental protection efforts (Ahmad & Mahmood, 2019).

Additionally, technical capacity remains a significant concern, with insufficient expertise and equipment hindering enforcement activities. Inadequate access to advanced technology, data analysis tools, and forensic investigation techniques impairs the ability to detect, investigate, and prosecute environmental violations. Without adequate technical resources and training, regulatory agencies face challenges in gathering evidence, analyzing data, and building cases against violators. Addressing resource constraints requires increased investment in environmental agencies, capacity-building initiatives, and the deployment of advanced technology to strengthen enforcement efforts and improve environmental governance in Pakistan (Ahmad & Mahmood, 2019).

#### **5.5.3 Regulatory Gaps**

Legal loopholes and inadequate provisions for enforcement can be found in various environmental laws and regulations in Pakistan. For instance, the PEPA of 1997 may contain sections lacking specificity or clear directives, making them subject to interpretation. Specific sections within PEPA or its associated regulations may exhibit vague definitions or insufficient guidance on enforcement procedures, contributing to inconsistent application and enforcement by regulatory authorities. Additionally, other environmental laws and regulations, such as those governing water pollution, air quality, waste management, and biodiversity conservation, may also suffer from similar deficiencies. Without precise and unambiguous provisions, these legal loopholes undermine the effectiveness of environmental governance and enforcement efforts, allowing polluters to exploit gaps in the law and evade accountability (Ali & Naeem, 2020).

#### **5.5.4 Socio-Economic Factors**

Socio-economic factors play a significant role in exacerbating environmental challenges in Pakistan. Poverty and the prevalence of informal economic activities contribute to environmental degradation and hinder compliance with environmental laws. Socio-economic disparities often result in marginalized communities engaging in informal sectors such as agriculture, construction, and waste management. In these sectors, poor enforcement of labor and environmental standards allows for unchecked pollution and resource depletion (Khawaja & Ahmad, 2019).

Moreover, the lack of public awareness and environmental literacy poses another challenge to environmental enforcement efforts. Limited understanding of environmental rights, responsibilities, and legal obligations undermines community engagement and participation in enforcement activities. Without adequate awareness, the public may not fully grasp the importance of environmental protection or recognize the significance of complying with environmental laws. This lack of awareness reduces public support for enforcement measures and hampers efforts to address environmental issues effectively (Iqbal & Tariq, 2018).

## 5.6 Stakeholder Perspectives

In Pakistan, industries often perceive environmental regulations as burdensome and costly, leading to resistance and non-compliance. Concerns about competitiveness, profitability, and regulatory uncertainty significantly shape their attitudes towards environmental enforcement. Industries may prioritize immediate financial gains over long-term environmental sustainability, contributing to non-compliance and environmental degradation (Ali & Mustafa, 2018).

Conversely, communities impacted by environmental pollution in Pakistan face considerable challenges in seeking justice and addressing grievances. Limited awareness of legal rights, compounded by fear of reprisals from influential industry players or regulatory bodies, impedes community involvement in enforcement processes. Additionally, socio-economic vulnerabilities such as poverty and lack of education further marginalize affected communities in Pakistan, constraining their ability to advocate for environmental justice. These perspectives underscore the intricate dynamics of environmental enforcement within Pakistan (Ahmad & Khan, 2019).

## 5.7 Case studies of Environmental Degradation and Legal Disputes in Pakistan

In Pakistan, environmental degradation and legal disputes underscore the complexities of enforcing environmental laws. Rampant pollution, deforestation, and industrial activities often lead to environmental degradation, affecting public health and natural ecosystems. Legal disputes arise from violations of environmental regulations, land-use conflicts, and resource exploitation, highlighting gaps in enforcement and governance. These challenges demand comprehensive strategies to strengthen regulatory frameworks, enhance enforcement mechanisms, and promote sustainable development practices. Following case studies provide insights into the various factors contributing to environmental degradation, the role of legal frameworks in addressing environmental issues, and the obstacles encountered in enforcing environmental regulations (Chaudhry, 2022).

**1. Pollution of Water Bodies:** Environmental degradation in Pakistan is evident in the pollution of water bodies, including rivers and lakes, caused by industrial effluents and untreated sewage discharge. A prominent example is the contamination of the Indus River, the country's largest river, with toxic chemicals from industrial sources. This pollution has led to severe ecological damage, endangering aquatic life and disrupting the balance of fragile ecosystems. Moreover, communities reliant on the Indus River for drinking water and irrigation face significant health risks due to waterborne diseases and contamination. Despite regulations prohibiting the discharge of pollutants into water bodies, enforcement has been ineffective. Inadequate monitoring, lax enforcement measures, and corruption within regulatory agencies have allowed industrial pollution to persist unchecked, exacerbating environmental degradation and threatening the well-being of both ecosystems and human populations (Noor et al., 2023).

**2. Deforestation and Land Degradation:** Deforestation and land degradation pose significant environmental challenges in Pakistan, particularly in forested areas and ecologically sensitive regions. Illegal logging, land encroachment, and unsustainable land use practices have resulted in widespread deforestation, soil erosion, and loss of biodiversity. These activities not only degrade natural habitats but also exacerbate environmental issues such as climate change and natural disasters. The consequences of deforestation and land degradation are particularly pronounced in Pakistan's forested regions, where rampant exploitation of natural resources has led to severe environmental degradation. Soil erosion, exacerbated by the removal of vegetation cover, has increased the risk of landslides and flash floods, threatening both human settlements and wildlife habitats. Additionally, loss of biodiversity due to habitat destruction has far-reaching ecological implications, impacting the resilience of ecosystems and the well-being of local communities (Khan et al., 2013).

Legal disputes often arise in areas characterized by environmental degradation, such as deforestation and land degradation, involving government authorities, local communities, and commercial interests. These conflicts may specifically revolve around issues such as land ownership, resource extraction rights, and conservation efforts, further complicating efforts to address environmental challenges. Resolving these disputes and implementing sustainable land management practices are essential steps towards mitigating environmental degradation and promoting ecological resilience in Pakistan.

One notable case highlighting the challenges of deforestation and land degradation in Pakistan is the ongoing dispute over the Margalla Hills National Park in Islamabad. The Margalla Hills, a crucial ecological zone, face threats from illegal logging, encroachment for urban development, and unsustainable land use practices (Khalid et al. 2021).

Local communities, environmental activists, and government authorities have been engaged in legal battles and advocacy efforts to protect the Margalla Hills from further degradation. Conflicts arise over issues such as land ownership, zoning regulations, and the allocation of resources between conservation and development interests.

Efforts to address these disputes involve balancing the need for sustainable development with the preservation of natural habitats and biodiversity. Implementing effective land management strategies, enforcing environmental regulations, and promoting community participation are essential to safeguarding the Margalla Hills and similar ecologically sensitive areas in Pakistan (Khalid et al. 2021).

**3. Air Pollution and Urbanization:** The rapid urbanization and industrialization of major cities in Pakistan, such as Karachi, Lahore, and Islamabad, have led to alarming levels of air pollution. Particulate matter, vehicular emissions, and industrial pollutants contribute significantly to the deterioration of air quality in these urban centers. Despite the presence of air quality standards and regulations, enforcement remains inadequate due to various challenges.

Limited monitoring infrastructure, insufficient enforcement mechanisms, and difficulties in regulating informal and small-scale industries hinder effective enforcement of air pollution control measures. Legal disputes often arise regarding the allocation of responsibility for air pollution control, compensation for affected communities, and regulatory oversight of polluting industries. These disputes underscore the pressing need for robust legal frameworks and enforcement mechanisms to address air pollution effectively and safeguard public health and the environment in urban areas of Pakistan (Bilal et al., 2021).

One notable case illustrating the challenges of air pollution in Pakistan's major cities is the "Smog Crisis" that frequently occurs during the winter months. Cities like Lahore often experience severe smog episodes characterized by high levels of particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>), nitrogen oxides (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), and other pollutants (Arif & Hassan, 2023). During these episodes, air quality deteriorates to hazardous levels, posing serious health risks to residents and causing respiratory illnesses, cardiovascular problems, and even premature deaths. The smog crisis exacerbates existing health issues, particularly among vulnerable populations such as children, the elderly, and individuals with pre-existing health conditions. Following table presents the Air Quality Index (AQI) values along with corresponding advisory levels established by the American Lung Association (ALA) to guide individuals on outdoor activities based on current air quality conditions. Ranging from "Good" to "Hazardous," these advisories provide essential guidance for individuals, particularly those with respiratory conditions, to make informed decisions regarding outdoor exertion and minimize potential health risks associated with air pollution.

**Table 1: Air Quality Index (AQI) Advisory Levels for Outdoor Activities**

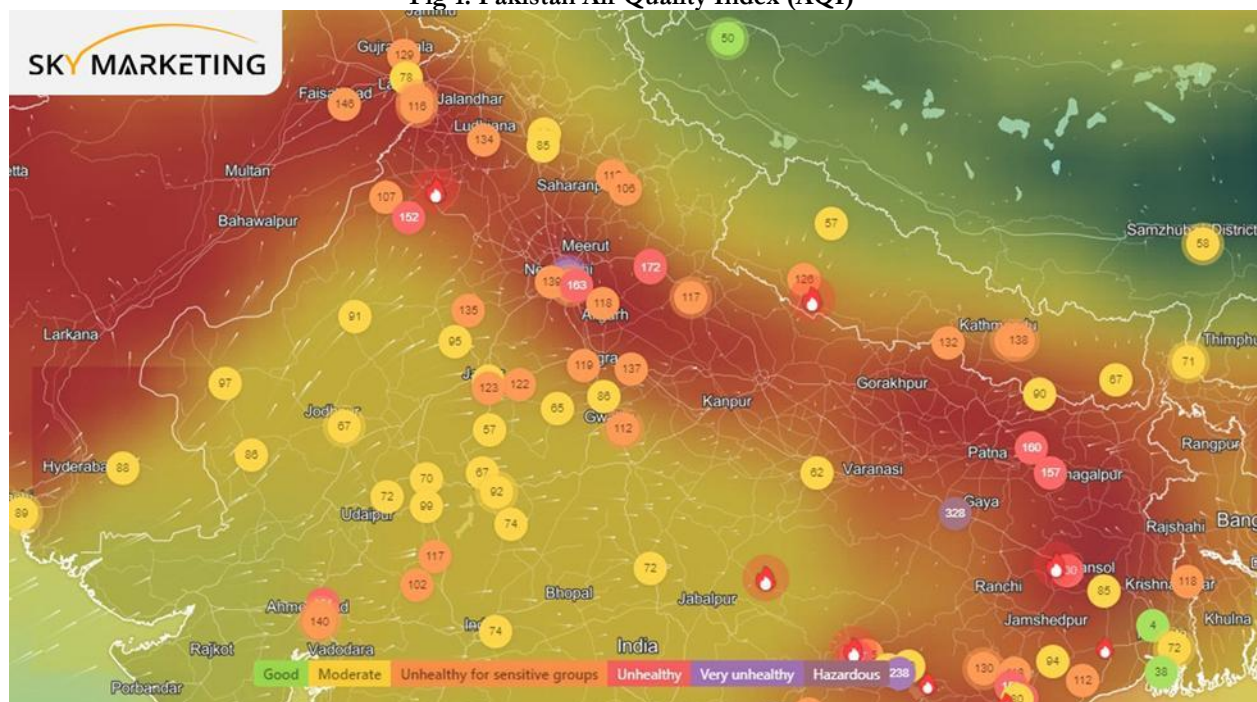
Name	Index Value	Advisory
Good	0 to 50	None
Moderate	51 to 100	Usually sensitive individuals should consider limiting prolonged outdoor exertion.
Unhealthy for Sensitive Groups	101 to 150	Children, active adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.
Unhealthy	151 to 200	Children, active adults, and people with respiratory disease, such as asthma, should avoid outdoor exertion; everyone else should limit prolonged outdoor exertion.
Very Unhealthy	201 to 300	Children, active adults, and people with respiratory disease, such as asthma, should avoid outdoor exertion; everyone else should limit outdoor exertion.
Hazardous	301 to 500	Everyone should avoid all physical activity outdoors.

Source: What Is the Air Quality Index? American Lung Association, <https://www.lung.org/clean-air/outdoors/air-quality-index> accessed on 04 April 2024.

These advisories from ALA aim to inform individuals about the air quality conditions and provide guidance on outdoor activities to minimize health risks associated with air pollution.

The Air Quality Report in Pakistan is given in the following figure to provide essential guidance for individuals, particularly those with respiratory conditions, to make informed decisions regarding outdoor exertion and minimize potential health risks associated with air pollution.

**Fig 1: Pakistan Air Quality Index (AQI)**



Source: Pakistan Air Quality Index (AQI), Air Pollution Report for 17-06-2023. Sky marketing, <https://www.skymarketing.com.pk/news/pakistan-air-quality-index-aqi-air-pollution-report-for-17-06-2023/>. accessed on 04 April 2024.

The Pakistan Air Quality Index (AQI) indicates that the air quality in Pakistan is unhealthy. High levels of pollutants such as particulate matter (PM2.5 and PM10), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), and ozone (O<sub>3</sub>) contribute to poor air quality across various cities and regions. This unhealthy air quality poses significant risks to public health, increasing the likelihood of respiratory problems, cardiovascular diseases, and other adverse health effects.

Hence, legal disputes emerge regarding the accountability of diverse stakeholders in Pakistan, encompassing government bodies, industries, and vehicle proprietors, for their role in exacerbating air pollution and neglecting sufficient measures to alleviate its consequences. The government encounters mounting pressure to enforce air quality regulations, institute emission control initiatives, and enhance monitoring and enforcement mechanisms. These actions are imperative to tackle the persistent smog crisis in Pakistan and safeguard public health against the detrimental effects of air pollution (Anjum et al., 2021).

**4. Land Contamination and Hazardous Waste Management:** Cases of land contamination and improper hazardous waste management in Pakistan highlight the challenges of regulating industrial activities and mitigating environmental risks. For example, improper disposal of hazardous chemicals and industrial waste has resulted in soil contamination, groundwater pollution, and health concerns in areas near industrial sites and landfills. Legal disputes frequently arise over who bears responsibility for environmental cleanup, compensating affected communities, and overseeing hazardous waste disposal practices (Rahman, 2013).

These challenges underscore the necessity for stringent environmental regulations and robust enforcement measures in Pakistan. Such regulations should aim to prevent land contamination and ensure proper waste management practices. Additionally, there's a need for enhanced monitoring and enforcement capabilities to address violations effectively and hold responsible parties accountable. By implementing comprehensive environmental laws and enforcement mechanisms, Pakistan can better protect its land and communities from the adverse effects of industrial pollution and hazardous waste mismanagement (Jaspal & Haider, 2020).

One example of land contamination and hazardous waste mismanagement in Pakistan is the case of the Gadani Ship-Breaking Yard in Baluchistan. The ship-breaking industry at Gadani involves dismantling old ships to salvage metal and other materials, but it has led to severe environmental pollution and health hazards due to improper disposal of hazardous materials such as asbestos, lead, and toxic chemicals.

The area surrounding the ship-breaking yards has been contaminated with heavy metals and other pollutants, posing risks to the health of workers and nearby communities. Legal disputes have arisen over the responsibility for environmental cleanup, compensation for affected individuals, and the regulation of hazardous waste disposal practices at the yard (Memon & Zarar, 2016).

This case underscores the urgent need for stronger environmental regulations and enforcement measures in Pakistan's ship-breaking industry to prevent further land contamination, protect public health, and ensure the sustainable management of hazardous waste.

In conclusion, case studies of environmental degradation and legal disputes in Pakistan demonstrate the complexities of enforcing environmental laws in practice. Addressing these challenges requires concerted efforts to strengthen regulatory frameworks, improve enforcement mechanisms, enhance monitoring and compliance systems, and promote stakeholder engagement and public participation in environmental governance.

## 5.8 Perspectives of Stakeholders for effective Environmental Governance

Environmental governance in Pakistan is a multifaceted endeavor that involves a diverse range of stakeholders, each with unique perspectives, roles, and responsibilities. From government officials to civil society organizations, industry representatives, academics, and affected communities, stakeholders play crucial roles in shaping environmental policies, implementing regulations, and advocating for environmental justice. Understanding their perspectives provides valuable insights into the effectiveness, challenges, and potential solutions for addressing environmental concerns in the country (Ahmad et al., 2020).

Government officials are central to environmental governance in Pakistan, as they formulate and execute environmental policies and regulations. Interviews with government officials offer insights into the challenges faced by regulatory agencies, such as resource constraints, bureaucratic hurdles, and political dynamics affecting enforcement efforts. Additionally, officials' perspectives provide critical input on policy gaps, legislative reforms, and strategies to enhance environmental governance and compliance. Leveraging the expertise and perspectives of government officials can strengthen Pakistan's environmental governance framework, ensure better compliance with environmental laws, and advance sustainable development goals (Ahmad et al., 2020).

Civil society organizations (CSOs) are instrumental in advocating for environmental protection and social justice in Pakistan. Through surveys and focus group discussions, CSOs offer grassroots perspectives on environmental justice issues, community concerns, and advocacy initiatives. They often pinpoint deficiencies in environmental regulations, instances of non-compliance or regulatory capture, and the importance of enhancing public participation in decision-making processes related to environmental policy and planning. By amplifying the voices of marginalized communities and raising awareness about environmental challenges, CSOs foster transparency, accountability, and civic participation in environmental governance.

Industry representatives in Pakistan, spanning manufacturing, energy, agriculture, and other sectors, aim to harmonize economic growth with environmental preservation. Interviews with industry stakeholders provide insights into their perspectives on regulatory compliance, environmental management practices, and corporate social responsibility initiatives. These stakeholders offer nuanced views on the challenges of adhering to environmental regulations, the associated costs and

benefits, and opportunities for collaboration with government and civil society to tackle environmental issues. Their input is crucial for fostering sustainable industrial practices and ensuring that economic development aligns with environmental sustainability goal (Ahmad et al. 2020).

Academics and researchers contribute crucial expertise and knowledge to understanding environmental issues, evaluating policy effectiveness, and identifying best practices for sustainable development. Through surveys and interviews, they offer research findings, policy recommendations, and assessments of existing environmental laws. Academics stress the importance of evidence-based policymaking and interdisciplinary collaboration to tackle complex environmental issues effectively. They play a pivotal role in shaping environmental discourse, informing policy decisions, and fostering sustainable development initiatives tailored to Pakistan's socio-economic and environmental context.

In Pakistan, communities residing near industrial areas, polluted water bodies, and degraded lands, bear the brunt of environmental degradation. Through focus group discussions and community surveys, their perspectives, concerns, and experiences regarding environmental risks, health impacts, and livelihood challenges can be documented. These communities often advocate for environmental justice, demanding accountability from polluters and seeking greater representation in decision-making processes related to environmental policy and planning (Mir et al, 2023).

In short, stakeholder perspectives on environmental governance in Pakistan provide valuable insights into the multifaceted challenges and opportunities for promoting environmental sustainability, social equity, and economic development. By engaging with diverse stakeholders, policymakers can develop more inclusive, effective, and responsive environmental policies and governance mechanisms that address the needs and priorities of all stakeholders while safeguarding the environment for present and future generations.

### 5.9 The Effectiveness of Pakistan's Environmental Laws in Achieving Environmental Justice

The effectiveness of Pakistan's environmental laws in achieving environmental justice is a multifaceted issue influenced by various factors such as regulatory enforcement, stakeholder engagement, and socio-economic dynamics. While Pakistan has established comprehensive environmental legislation, including the PEPA of 1997, the practical implementation and enforcement of these laws often face significant challenges (Arif & Alvi, 2020).

One example of the struggle for environmental justice in Pakistan is the pollution of water bodies, particularly the contamination of the Indus River, the country's largest river. Despite regulations prohibiting the discharge of pollutants into water bodies, industrial effluents and untreated sewage continue to contaminate rivers and lakes, posing health risks to communities reliant on these water sources for drinking, agriculture, and other purposes. The lack of effective enforcement mechanisms, inadequate monitoring, and corruption within regulatory agencies contribute to the persistence of water pollution issues, undermining environmental justice and exacerbating public health concerns (Butt et al., 2018).

Similarly, air pollution in urban centers such as Karachi, Lahore, and Islamabad highlights the challenges in achieving environmental justice. Rapid urbanization and industrialization have led to high levels of air pollution, posing significant health risks to residents. Despite the existence of air quality standards and regulations, enforcement remains weak due to limited monitoring infrastructure, insufficient enforcement mechanisms, and regulatory challenges in regulating informal and small-scale industries. As a result, marginalized communities living in urban areas bear the brunt of air pollution, facing disproportionate health impacts and barriers to accessing clean air (Khan & Shafique 2019).

Furthermore, issues such as deforestation, land degradation, and hazardous waste management further illustrate the complexities of achieving environmental justice in Pakistan. Illegal logging, land encroachment, and unsustainable land use practices contribute to environmental degradation and pose threats to biodiversity and ecosystem integrity. Legal disputes over land ownership, resource extraction rights, and conservation efforts further complicate efforts to address environmental challenges and ensure equitable outcomes for affected communities (Khan & Shafique 2019).

In addressing these challenges, enhancing regulatory enforcement, strengthening institutional capacities, promoting stakeholder engagement, and prioritizing environmental justice considerations are essential. Effective implementation of environmental laws requires robust monitoring systems, transparent governance structures, and mechanisms for public participation and accountability. Additionally, addressing socio-economic disparities, improving access to justice, and empowering marginalized communities are crucial for advancing environmental justice goals in Pakistan (Arif & Suleri, 2019).

Therefore, achieving environmental justice in Pakistan requires concerted efforts from government authorities, civil society organizations, industry stakeholders, and local communities. By addressing regulatory gaps, strengthening enforcement mechanisms, and promoting inclusive decision-making processes, Pakistan can advance towards a more equitable and sustainable environmental future (Arif & Suleri, 2019).

## 6. RECOMMENDATIONS

- 1. Strengthening Regulatory Capacity:** Invest in training and capacity-building for regulatory agencies to enhance their monitoring, enforcement, and compliance efforts. Provide adequate resources and technical support to improve regulatory effectiveness at all levels.
- 2. Enhancing Public Participation:** Promote inclusive decision-making processes by engaging local communities, civil society organizations, and other stakeholders in environmental governance. Strengthen mechanisms for public consultation, EIAs, and grievance redressal to ensure meaningful participation.
- 3. Improving Enforcement Mechanisms:** Enforce strict penalties for environmental violations to deter non-compliance and promote accountability. Enhance coordination between regulatory agencies, law enforcement authorities, and judiciary to expedite legal proceedings and ensure timely justice for affected communities.

**4. Promoting Environmental Education and Awareness:** Invest in environmental education and awareness-raising campaigns to empower citizens with knowledge about their rights, responsibilities, and the importance of environmental conservation. Foster a culture of environmental stewardship and sustainability at all levels of society.

**5. Addressing Socio-Economic Disparities:** Implement targeted interventions to address socio-economic disparities in environmental exposure and vulnerability. Prioritize environmental justice in development planning, infrastructure projects, and resource allocation to ensure equitable distribution of environmental benefits and burdens.

In conclusion, promoting environmental justice in Pakistan requires concerted efforts to strengthen regulatory capacity, enhance public participation, improve enforcement mechanisms, and address socio-economic disparities. By implementing the proposed recommendations for policy reform and institutional strengthening, Pakistan can advance environmental justice objectives and ensure a clean, healthy, and sustainable environment for present and future generations.

## 7. CONCLUSION

The pursuit of environmental justice in Pakistan faces multifaceted challenges rooted in regulatory enforcement, stakeholder engagement, socio-economic dynamics, and institutional capacities. Despite the presence of comprehensive environmental legislation, notably the PEPA of 1997, the practical implementation and enforcement of these laws encounter significant hurdles, resulting in environmental degradation, public health hazards, and unequal outcomes for affected communities.

Key challenges to environmental justice in Pakistan include the pollution of water bodies, exemplified by the contamination of the Indus River and other water sources. Despite regulations prohibiting pollutant discharge, industrial effluents and untreated sewage persistently contaminate rivers and lakes, posing health hazards and jeopardizing environmental sustainability. Weak enforcement mechanisms, inadequate monitoring, and corruption within regulatory bodies exacerbate water pollution issues, necessitating stronger regulatory enforcement and governance reforms.

Similarly, urban air pollution, notably in cities like Karachi, Lahore, and Islamabad, poses significant challenges to environmental justice. Rapid urbanization and industrialization have led to elevated levels of air pollution, disproportionately affecting marginalized communities and posing severe health risks. Despite existing air quality standards, weak enforcement, limited monitoring infrastructure, and regulatory hurdles impede efforts to combat air pollution effectively, necessitating comprehensive pollution control strategies and public health safeguards.

Furthermore, issues such as deforestation, land degradation, and hazardous waste mismanagement underscore the complexities of environmental justice in Pakistan. Illegal logging, land encroachment, and unsustainable land use practices contribute to environmental degradation, threatening biodiversity and ecosystem health. Legal disputes over land ownership and resource extraction further complicate efforts to address environmental challenges, highlighting the need for transparent governance and conflict resolution mechanisms.

Addressing these challenges requires collaborative efforts from government authorities, civil society organizations, industry stakeholders, and local communities. Strengthening regulatory enforcement, enhancing institutional capacities, promoting stakeholder engagement, and advancing socio-economic equity are essential for achieving environmental justice objectives. Robust monitoring systems, transparent governance structures, and mechanisms for public participation and accountability are necessary to ensure effective implementation of environmental laws and regulations.

Moreover, addressing socio-economic disparities, improving access to justice, and empowering marginalized communities are critical for advancing environmental justice goals. By fostering inclusive decision-making processes, encouraging collaboration between stakeholders, and prioritizing environmental justice considerations, Pakistan can strive towards a more equitable and sustainable environmental future.

In conclusion, achieving environmental justice in Pakistan demands comprehensive reforms, collective action, and sustained commitment from all stakeholders. By addressing regulatory gaps, strengthening enforcement mechanisms, and promoting equitable access to environmental resources and benefits, Pakistan can progress towards a more just and sustainable society for present and future generations.

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