

# Feasibility of Preventing Industrial Pollution from the Perspective of the Civil and Criminal Liability Systems in Iranian Law

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## Abstract

Environmental pollution resulting from industrial activities is one of the major challenges of the contemporary era, threatening both human health and ecosystem balance. This article examines the various dimensions of the legal liability of polluting industries for environmental damage within the Iranian legal system. The primary objective of this study is to analyze the civil and criminal liability of individuals and entities responsible for industrial pollution in Iranian law. Considering the importance of environmental protection as stipulated in the Constitution and other substantive laws, this research aims to explore the challenges of implementing liability for polluting industries. The methodology of this research is based on a comparative legal study and library-based research focused on Iranian environmental regulations. Key findings indicate that Iranian law has the capacity to incorporate various foundations of civil liability, including strict liability, for polluting industries. Furthermore, Iranian criminal law emphasizes the criminal responsibility of legal entities for environmental pollution. However, challenges remain, such as proving criminal intent or fault, the severity of prescribed penalties, and the effective enforcement of criminal liability for legal entities. The conclusion suggests that although civil and criminal liability systems differ, they share common elements that can serve the principle of environmental pollution prevention. Effective environmental protection and the prevention of industrial pollution require enhanced coordination and interaction between civil and criminal liability systems. Nevertheless, weaknesses in monitoring and law enforcement remain significant obstacles to the effectiveness of these two systems. Therefore, reforming and clarifying existing laws, as well as strengthening international cooperation in this domain, appear to be essential.

**Keywords:** Pollutant, environmental pollution, prevention, interaction, damage, punishment, criminal liability, civil liability.

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## 1. Introduction

The environment, as the foundation of life and the common heritage of humanity, holds fundamental importance. In recent decades, the rapid expansion of industrial, agricultural, urban, and transportation activities has led to various types of environmental pollution affecting water, soil, and air. These pollutants not only endanger human health and the well-being of other living beings but also result in the destruction of natural resources, climate change, and the loss of biodiversity. Under such circumstances, the necessity of adopting preventive measures to avert or mitigate pollution becomes increasingly apparent. The *precautionary principle*, one of the foundational principles of environmental law, underscores the need for proactive intervention to prevent environmental damage, even in the absence of complete scientific certainty regarding the consequences of a particular activity.

The legal system of each country can play a crucial role in realizing this principle through various legal instruments. The Iranian legal approach to controlling industrial pollution is based on two main pillars: permits and liabilities. The permit-based approach focuses on issuing necessary licenses for industrial and economic activities to ensure compliance with environmental standards, though effective oversight of implementation remains a consistent challenge. Several laws, including Article 50 of the Constitution, the Clean Air Act, the Waste Management Act, and laws related to water and soil conservation, define the framework for licensing, standard-setting (for air, water, soil, noise, and waste), and enforcement measures such as shutting down non-compliant facilities by the Department of Environment. Nonetheless, challenges such as a lack of transparency in the permitting process persist. Imports of technology and goods are also recognized as vectors of pollution transmission.

The liability-based approach aims to deter and compensate for environmental harm through legal instruments and penal provisions. Among these tools, civil and criminal liability laws hold special significance. These laws impose obligations to compensate for damages (in civil liability) and prescribe penalties for harmful conduct (in criminal liability), functioning as deterrents and encouraging both individuals and legal entities to adhere to environmental standards and avoid polluting behaviors. Iranian law is no exception and has incorporated various legal provisions to address environmental pollution and assign responsibility to polluters. The objective of this article is to examine the capacities and challenges within the Iranian civil and criminal liability systems to prevent environmental pollution and to assess the feasibility of achieving this goal through the aforementioned legal instruments.

## 2. The Environment and Environmental Pollution

The environment is a broad and complex concept encompassing all physical, biological, social, economic, and political dimensions. This concept includes not only nature and living organisms but also the reciprocal interactions between humans and their surrounding natural environment. In legal terms, the environment is defined as the space in which all living beings exist with their diverse conditions and interrelations. René Maheu, former Director-General of UNESCO, also emphasized that the environment is a comprehensive concept that encompasses humans, nature, and the interactions between them ([Shamibati, 2001](#)).

Pollution arises from various sources, including unregulated industrialization, population growth, urban development, and excessive plastic consumption. Pollutants are generally classified into two main categories: natural and anthropogenic. Natural pollutants result from geological and ecological phenomena, while anthropogenic pollutants stem from urban, industrial, and agricultural activities. Pollutants can also be classified based on their origin, nature, and the medium they contaminate. These include physical, chemical, and biological pollutants such as noise, vibration, radiation, chemical compounds, and living organisms. Additionally, pollutants may exist in solid, liquid, or gaseous forms. Pollution may be local, regional, or even global, with significant adverse effects on the environment and living organisms ([Choopani, 2009](#)).

### 2.1. Industrial Pollution

According to Resolution No. 241670/T59793H on the criteria for determining pollution levels of production, industrial, mining, and service units, approved by the Council of Ministers on March 18, 2023, a polluting unit is defined as one that fails to comply with environmental standards. This definition emphasizes the importance of environmental consideration and the shift from an anthropocentric to an ecocentric approach in environmental legislation. Humans are part of the environment and

beneficiaries of its resources. Environmental pollution has had substantial negative effects on human health, resulting in serious health issues such as infant mortality, respiratory diseases, various allergies, cardiovascular disorders, elevated stress levels, and even psychological problems. These health consequences have raised significant concerns among communities (Kelishadi, 2012).

The energy industry, particularly coal-fired power plants, pollutes the air by burning fossil fuels and releasing greenhouse gases (CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>x</sub>) and particulate matter. The oil and gas industries contribute to air and water pollution through extraction, refining, and transportation, emitting pollutants such as CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>x</sub>, and hydrocarbons, and causing oil spills. The chemical industry, through the production of chemicals and plastics, releases toxic gases (chlorine, ammonia, NO<sub>x</sub>) and discharges wastewater containing hazardous organic substances and heavy metals.

Metal industries are major contributors to environmental pollution. These industries, especially during mining, smelting, and steel production, consume large amounts of fossil fuels, leading to air pollution (particulate matter, heavy metals such as lead and mercury), water pollution (acidic effluents), and substantial industrial waste and energy use. Cement production releases dust, particulate matter (PM), and greenhouse gases (CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>x</sub>), polluting air, water, and soil (Dadkhah et al., 2021).

Textile industries produce highly contaminated wastewater by using chemicals and dyes, threatening water sources and releasing toxic gases and vapors. Agricultural and food industries also contribute to soil and water pollution through the use of pesticides and chemical fertilizers. The automotive industry, in addition to air pollution caused by exhaust emissions of greenhouse gases and particulate matter, leads to noise pollution, water contamination (oil leaks and chemical spills), and waste generation. Obsolete vehicles and manufacturing processes intensify this pollution. The expansion of transportation and increased use of private vehicles, particularly in urban areas, has led to high energy consumption and severe air pollution (exhaust gases, particulate matter) and noise pollution (Ma'soumzadeh & Rahmani, 2017).

Environmental law, as a relatively modern branch of legal science, aims to protect and improve environmental quality and ensure the sustainable use of natural resources. One of the main objectives of this discipline is the prevention of environmental degradation and pollution.

### 3. The Precautionary Principle and Its Impact on the Environment

Article 50 of the Constitution of the Islamic Republic of Iran, as the principal environmental provision, emphasizes civil liability concerning nature and natural resources. This article, with a forward-looking perspective, focuses on the prevention of environmental damage and the protection of natural resources. The importance of this preventive approach in civil liability continues to grow, as it helps avert environmental destruction and protects future generations from serious issues. The overarching aim is to maintain balance and public welfare, ensuring that both economic and non-economic activities do not harm the environment. This law, with future generations in mind, seeks to preserve the environment through the prevention of harm (Valaey, 2009).

The precautionary principle, affirmed in various international instruments such as the Rio Declaration, asserts that one should not wait for damage to occur before taking action; instead, preventive measures must be taken from the outset. A variety of legal tools support this goal, including environmental standards, environmental impact assessments, operational permits, and liability systems.

Article 104 of the Third Development Plan Act, based on the precautionary principle, obliges production units to comply with environmental standards, particularly in relation to natural resources and water. This law treats the costs of compliance with environmental regulations as allowable business expenses. Similarly, Article 71 of the Fourth Development Plan Act follows this line. Article 45 of the Law on the Collection of Certain Government Revenues requires factories and workshops to allocate one per thousand of their sales revenue for pollution control and environmental damage compensation, under the supervision of the Department of Environment. Although not classified as a green tax, this measure aims at pollution prevention.

Article 55 of the Municipal Law designates municipalities as responsible for preventing the establishment of polluting factories and industries. This provision places municipalities at the forefront of combating urban pollution, granting them legislative and executive authority (Molaei & Rostami, 2020).

### 3.1. *Liability*

In Persian, the term *mas'ooliyat* (liability) means being obliged to perform a task or being committed to a duty (Moein, 2006). It also implies accountability for such actions. Generally, in social custom, liability refers to decision-making within the framework of social norms and public expectations (Eisaei Tafreshi et al., 2007). In this context, the term *responsible* refers to an individual who bears the burden of duties and is held accountable in case of failure to fulfill them.

In the *Moein Persian Dictionary*, the term *responsible* is defined as a person who has a duty and is committed to it (Moein, 2006). In other words, a responsible person is one who is answerable for performing a task or obligation and can be held accountable for failure to do so. Some scholars regard liability as a legal relationship that may arise from harmful acts or omissions. It is also defined as the legal obligation of a person to compensate for harm caused to another, whether the harm results from the person's own fault or from their activities (Jafari Langaroudi, 2008).

Accountability is a component of the normative system that enables individuals to recognize their own and others' rights, to respect those rights, and to shape their interactions accordingly. Within this normative framework, every person, in any position, has rights and responsibilities that define their role in society. Therefore, accountability, as a fundamental value, plays a key role in social cohesion and sustainable development and is manifested in three branches: moral liability, social liability, and legal liability.

### 3.2. *Moral Liability*

Moral liability refers to obligations that extend beyond formal legal rules and are guaranteed solely by individual conscience and ethics. It pertains to responsibilities one holds toward God, oneself, or one's conscience, without the imposition of legal penalties, and is enforced solely through moral awareness. This type of liability encompasses duties that may not be codified in law but are nonetheless ethically and morally significant (Jafari Langaroudi, 2008). Others describe "moral responsibility" as the ability and capacity to explain or justify a behavior or characteristic. In some cases, liability is defined as "being subject to punishment" or "responsibility before God, the outcome of which is spiritual punishment" (Mesbah Yazdi, 2002).

### 3.3. *Social Liability*

Social liability refers to the commitment of decision-makers to undertake actions that, in addition to securing their own interests, also contribute to the improvement of social welfare. In this context, several key points can be highlighted. First, social responsibility is an obligation to which organizations must be accountable. Second, organizations should avoid environmental pollution, discrimination in hiring, neglect of employee needs, and the production of goods harmful to public health. Finally, they must allocate financial resources to enhance social welfare in a manner accepted by the majority of society. Such actions include support for national culture, cultural institutions, and the enhancement of quality of life (Ghaehri, 2008).

Corporations have responsibilities toward society, individuals, and the environment that go beyond financial and economic considerations. Corporate social responsibility (CSR) encompasses activities that aim not only at profitability but also at social benefit and welfare, exceeding mere legal compliance. This concept reflects the commitment of corporations to balance commercial interests with positive impacts on society and the environment (Amir Hosseini & Ghabadi, 2016).

### 3.4. *Legal Liability*

Despite its numerous advantages, the Industrial Revolution also brought about unintended consequences, one of which is environmental pollution—a serious threat to human health and the natural environment. To address this challenge, a dual approach is proposed: first, utilizing religious and moral teachings to raise awareness and promote responsible behavior; second, employing legal mechanisms—including civil and criminal sanctions—to exert pressure and manage the crisis. This dual strategy can help reduce the harmful effects of pollution and preserve public health and nature (Mohajer & Nejad Moghadam Zanjani, 2022).

All persons, whether natural or legal, bear responsibility for environmental protection. This responsibility means that an individual is obliged to compensate for damages caused to others—a concept referred to in legal terminology as legal liability (Mohajer & Nejad Moghadam Zanjani, 2022).

Damages are generally divided into two broad categories: material and moral. Each category can result from various sources, such as crime, quasi-delict, breach of contractual obligations, or extra-contractual factors. These damages may be classified and analyzed according to the conditions and causes that gave rise to them.

Criminal and civil liability, as two fundamental legal concepts, are often perceived in contrast to one another due to differences in objectives, subject matter, and enforcement mechanisms. However, a closer examination of their shared elements reveals notable similarities. For instance, both types of liability involve the occurrence of harm, an act considered wrongful, and a causal link between the act and the resulting harm. These similarities suggest that, despite their distinct features, civil and criminal liability may converge in certain aspects. Each system, through its own mechanisms and objectives, can contribute to the principle of prevention and positively influence environmental protection.

#### 4. Jurisprudential Foundations of Liability

Various rules and principles have been developed to delineate the boundaries and scope of individual liability. These principles, derived from the primary sources of Islamic jurisprudence—namely the Qur’an, Sunnah, reason, and consensus—are known as *fiqh rules of liability*. These rules form the basis for civil liability (obligation to compensate) and, in many cases, lay the groundwork for criminal liability (eligibility for punishment).

Due to their flexibility, Islamic jurisprudential rules provide the necessary foundations for holding polluting industries accountable for environmental damage. According to the *no harm* principle (*la zarar*), no one has the right to harm others or the public interest; therefore, in the event of damage (such as pollution caused by industries), the responsible party must provide compensation. Based on the *destruction* principle (*itlaf*), anyone who destroys another’s property—including natural resources and the environment, considered public goods—is liable for its restitution, even if the act was unintentional. Under the *causation* principle (*tasbib*), if an individual’s indirect actions (such as industrial activity) result in damage or loss to another’s property (e.g., the environment), that individual is responsible for the harm (Niknam et al., 2023).

The *public interest* principle (*maslahat*) prioritizes the five essential interests—religion, life, intellect, progeny, and property—over private interests. Since industrial pollution endangers human life and property, protecting the environment and the public good is superior to the interests of polluting industries (Fahimi & Arabzadeh, 2012). The *respect for property of believers* principle asserts that a Muslim’s property (and by extension, public property such as the environment) is inviolable, and any harm to it requires compensation. The *prohibition of destruction* principle (*nafi halakat*) deems actions leading to destruction—including environmental degradation and threats to public health—as religiously forbidden. These jurisprudential rules provide a robust legal framework for obligating industries to prevent pollution and compensate for environmental damages (Niknam et al., 2023).

By defining the elements and conditions of liability, these rules establish the foundation for holding individuals accountable for harm caused to others (civil liability) and for subjecting them to punishments for harmful or prohibited acts (criminal liability). While Islamic jurisprudence does not explicitly separate civil and criminal liability under contemporary labels, it clearly distinguishes them in their foundations and consequences. Civil liability primarily concerns restitution and restoring the harmed party to their original condition, while criminal liability emphasizes punitive, deterrent, and corrective measures, and is associated with penalties such as retribution (*qisas*), blood money (*diyya*), prescribed punishments (*hudud*), and discretionary penalties (*ta’zir*).

In this regard, jurisprudential principles such as “the direct actor prevails over the indirect cause” (*aqwa al-mubashir min al-sabab*) and “combination of cause and direct actor” (*ijtima’ sabab wa mubashir*) are useful in determining primary liability in complex cases. These rules help resolve conflicts among multiple contributing factors to a harmful event and clarify which party bears ultimate responsibility. Furthermore, *intention* and *will* play a critical role in establishing liability, especially in criminal matters where many offenses require proof of criminal intent. Both civil and criminal liability require accurate identification of the relevant elements and conditions and their application to the specific event under review.

## 5. Legal Principles of Liability

The theoretical foundations of environmental liability are rooted in both general principles of law and specific principles of environmental law. Among the most significant of these is the *Polluter Pays Principle*, which holds that the costs of prevention, control, and compensation for pollution-related damage must be borne by the polluting party. This principle encompasses both preventive and compensatory dimensions (Molaei, 2020; Molaei & Rostami, 2020).

Another critical principle in this domain is the *Prevention Principle*. According to this principle, necessary measures should be taken to prevent environmental damage before it occurs. Requiring industries to comply with environmental standards, obtain appropriate permits, and utilize clean technologies are examples of this principle in action (Estara'badi, 2017).

The *Precautionary Principle* applies in situations where there is scientific uncertainty regarding the environmental consequences of a particular activity. Under this principle, the absence of complete scientific certainty should not be used as a justification to delay effective measures aimed at preventing serious or irreversible environmental harm. This principle shifts the burden of proof for safety onto the industrial actor (Hayati, 2014).

The principle of *Sustainable Development* seeks to balance environmental exploitation with the rights of future generations. However, it has yet to be fully adopted as a practical guideline for global actions, reflecting the ongoing challenges in implementing sustainability principles in a world where the equilibrium between progress and environmental protection remains a pressing concern.

### 5.1. Civil Liability

In legal terms, civil liability refers to “the legal obligation of a person to compensate for harm caused to another, whether this harm results from the person’s fault or from their activities” (Jafari Langaroudi, 2008). Civil liability entails the legal obligation to redress damage inflicted upon another person. This damage may stem from personal fault or from the nature of the individual’s activities. In legal theory, civil liability encompasses accountability for violating norms that govern social and civil relations. As such, it reflects the responsibilities that arise from human social interaction. In Iranian law, this concept is generally referred to as *zeman* (guarantee), which implies the obligation to compensate for harm and to account for the consequences of wrongful or unlawful conduct in civil relationships. Some legal scholars assert that whenever a person is compelled to compensate for another's harm, they are said to be liable (Katouzian, 2008, 2015).

The primary objective of civil liability is to provide redress to the injured party. Nevertheless, the imposition of substantial compensation for environmental damages may indirectly encourage economic and industrial actors to adopt greater precautionary measures and to invest in cleaner and safer technologies in order to avoid such liabilities in the future. This deterrent aspect of civil liability reveals its preventive function.

Some jurists argue that relying solely on civil liability for redress is insufficient in environmental matters, as the resulting harm is often irreversible. The primary goal of legal action, in addition to compensating victims, should be the prevention of future incidents. Thus, civil liability should serve not only to redress harm but also to deter and regulate conduct to prevent recurrence of similar risks (Badini, 2005).

The result of civil liability for health-related harm is restoration and restitution to the previous state. The Civil Liability Act emphasizes fair principles and focuses on compensation and redress. In Iranian law, the essential elements of civil liability include:

1. **Damage** – Damage is a fundamental element; without harm, no liability arises.
2. **Harmful Act** – This refers to a voluntary act that causes bodily, financial, or reputational harm. Article 1 of the Civil Liability Act defines a harmful act as necessary for identifying the liable party.
3. **Causation** – Proving a causal link is particularly challenging when multiple factors contribute to the harm. For instance, in cases of damage from airborne dust in a specific geographic region, determining the proportion of liability for each contributing factor can be difficult. Articles 1 and 2 of the Civil Liability Act stress the need to establish a causal relationship between the fault and the resulting damage. The act focuses on compensation rather than punishment, which is a fundamental principle in civil liability.

## 6. Theoretical Foundations of Civil Liability

The foundations of civil liability for polluting industries are based on several legal theories, including the *fault-based theory*, *risk theory*, and *hybrid theories* (e.g., presumed fault, abnormal activities, risk versus benefit, rights-based guarantees, and strict liability).

Under the *fault-based theory*, which is the traditional basis, the burden of proving the polluter's fault lies with the injured party—a particularly difficult task in environmental damage cases due to their complexity. In Iranian civil law, fault includes both *excessive conduct* (exceeding customary boundaries) and *negligence* (failure to perform a duty).

In contrast, *risk theory* attributes liability to the party whose activities pose a risk and generate profit (e.g., industries), regardless of fault. *Hybrid theories* modify this approach. For example, the *presumed fault theory* shifts the burden of proving absence of fault to the polluting party. The *abnormal activity theory* attributes liability to inherently hazardous or unusual activities. The *risk versus benefit theory* emphasizes the obligation of beneficiaries of profit-generating activities to bear the resulting harm. The *guarantee of rights theory* establishes liability for the violation of fundamental rights (e.g., life, health, a clean environment) even in the absence of fault (Hajiazizi, 2013).

Iranian civil liability law is pluralistic and incorporates elements from multiple legal foundations. The 1960 Civil Liability Act is primarily fault-based, placing the burden of proof on the injured party. However, proving fault in industrial pollution cases is particularly challenging. The *presumed fault* model has been recognized in contexts such as employer liability and transportation operators, reversing the burden of proof. *Strict liability* imposes responsibility solely based on establishing causation between the activity and the harm, without requiring proof of fault (except in cases of force majeure). Given the nature of industrial activities and specific regulations—such as Article 50 of the Constitution and statutes governing water, air, and waste pollution—strict liability is applicable and serves a preventive function. *Absolute liability*, the most stringent form, does not permit exemption even in force majeure cases and applies in exceptional circumstances such as usurpation. The key distinction between strict and absolute liability lies in the former allowing exoneration through force majeure, while the latter does not. Iranian law has the capacity to accept various foundations, particularly strict liability, for polluting industries.

### 6.1. Civil Liability and Industrial Pollution in Iranian Law

Iranian legislation—including the Marine and Border Rivers Protection Act, the Waste Management Act, the Marine Areas Act, the Air Pollution Prevention Act (1995), Article 104 of the Third Development Plan Act, and the Soil Protection Act—emphasizes the civil liability of environmental polluters. These laws provide for fines and mandatory compensation for environmental and personal harm resulting from oil spills, waste, marine, air, and soil pollution.

Producers of industrial and hazardous waste are responsible for their management. Violators are required to retrieve or dispose of the waste, cease polluting activities, and remediate the environment. Nevertheless, the enforcement of waste management laws has faced challenges, and inadequate sanctions have led to widespread non-compliance.

International conventions such as the *Kuwait Convention*, the *OPRC Convention* (Oil Pollution Preparedness, Response and Cooperation), the *Caspian Sea Environmental Protection Convention*, and the *Stockholm Declaration* also emphasize the *Polluter Pays Principle* and the necessity of developing legal frameworks for civil liability and environmental damage compensation (Mir Mohammad Sadeghi, 2004).

Implementing regulations, such as the *Water Pollution Prevention Bylaw* and the *Executive Bylaw of Paragraph (c), Article 104 of the Third Development Plan Act*, detail wastewater treatment obligations for industries and methods for calculating damages and penalties. The *Soil Protection Act* stresses the identification of pollution, issuing warnings, mandatory cleanup, and compensation, with fines and cessation of activities for violators.

It is noteworthy that the *Clean Air Act* (2017) focuses more on criminal liability and does not explicitly address civil liability for polluting industries.

## 7. Challenges in the Field of Civil Liability

### 7.1. Feasibility of Replacing the Fault-Based Theory with Strict Liability

In Iranian law, the foundations of civil liability are primarily found in the *Civil Code* and the *Civil Liability Act* (enacted in 1960). The general rule is based on fault; that is, to hold someone liable for damages, the plaintiff must prove the defendant's fault (whether intentional or negligent), the occurrence of harm, and the causal link between the fault and the damage. This traditional basis faces serious challenges in cases of environmental damage. Proving the fault of a specific industrial entity for causing air or water pollution—especially when the pollution may stem from multiple sources—is extremely difficult (Katouzian, 2008, 2015). Moreover, establishing a direct causal relationship between the activities of a particular polluter and specific environmental damage (e.g., biodiversity loss or long-term groundwater pollution) can be complex or even impossible. The gradual, cumulative, and dispersed nature of many pollutants makes it difficult for victims or public prosecutors to prove the elements of fault-based liability. These evidentiary difficulties significantly undermine the deterrent function of traditional civil liability, as potential polluters may accept the risks of pollution, relying on these challenges in proof.

To overcome these issues, the concept of *strict liability* (liability without fault) has gained importance in environmental law. According to this theory, merely causing pollution or environmental harm resulting from hazardous or extraordinary activities is sufficient to establish liability, without needing to prove fault. This approach lifts the burden of proof from the injured party and creates a stronger incentive for economic actors to exercise utmost precaution and prevent incidents.

Although Iranian law continues to be primarily fault-based, a tendency toward strict or quasi-strict liability is evident in some specific statutes. For instance, Article 14 of the *Environmental Protection and Enhancement Act* (enacted in 1974 and later amended) and Article 20 of the *Waste Management Act* (enacted in 2004) impose liability on polluters for environmental damages without explicitly requiring proof of fault. Nevertheless, ambiguities in interpreting these provisions and the absence of clear stipulations for strict liability may still raise legal debates and hinder robust enforcement.

### 7.2. Assessment and Valuation of Environmental Damages

Another challenge in civil liability is the assessment and valuation of environmental damages. Environmental harm often has a non-economic and irreversible nature. How can the loss of a species, the pollution of a wetland, or the degradation of air quality be translated into monetary terms? Various economic valuation methods for environmental damages have been proposed, but none are without flaws. These assessment difficulties may result in damage awards that fall short of actual losses, thereby weakening the preventive and deterrent function of compensation orders.

### 7.3. Proving Legal Standing in Environmental Lawsuits

Civil liability and related doctrines are grounded in a fault-based legal system, placing the burden of proving legal standing on the plaintiff. However, the complexities of modern life and the emergence of new environmental challenges have made this requirement increasingly difficult for individuals involved in environmental disputes. This necessitates the development of a different mechanism for establishing legal standing in such cases, as their nature is distinct from other types of litigation. Under the *Civil Procedure Code*, there are limitations on claims for damages, which refer to the defendant's fault, destruction, or causation, with the plaintiff required to provide evidence. Furthermore, under the *Civil Liability Act*, the state is exempt from liability for damages arising from sovereign acts, even though state-owned industries today are among the largest environmental polluters (Molaei & Rostami, 2020).

## 8. Interaction Between General Traditional Rules and Public Law

In the legal system, the interaction between general traditional rules and public law—especially in civil liability—poses a complex challenge for courts. This complexity arises from fundamental differences between private and public law. While traditional rules focus on strict application of private law principles, public law aims to safeguard the public interest. This interaction requires careful consideration, particularly in cases where determining the subject and assigning responsibility are difficult. Courts must adopt solutions that balance private rights and public interests.



### 8.1. Criminal Liability

In criminal liability, the existence of a specific law that defines an act as a crime is essential. A crime is a prohibited and punishable act defined by the legislature. This material act, together with other elements, constitutes a criminal offense (Mohseni & Ansari, 2019). In criminal law, three core concepts form the foundation of the field: crime, criminal liability, and punishment. These three elements are interdependent, such that the imposition of a penalty requires proof of criminal liability, which in turn depends on proving the commission of a crime (Gholduzian, 2005).

Criminal liability aims to punish perpetrators of environmental crimes and protect fundamental societal values, including the right to a healthy environment. The imposition of penalties such as imprisonment, fines, or social exclusions sends a clear message that environmentally harmful conduct will not be tolerated. These sanctions, through both *specific deterrence* (targeting the offender) and *general deterrence* (affecting the broader society), can help prevent future offenses.

The realization of justice plays a crucial role in criminal liability. Justice is a longstanding ideal pursued in all societies, encompassing various dimensions, including social, political, economic, and particularly criminal justice. Legal scholars identify several key principles that underpin criminal justice, including the *presumption of innocence*, *legality of crimes and punishments*, *moral responsibility*, and the *principle of personal liability*. These principles form the foundation of the judiciary and ensure the protection of individual rights during legal proceedings (Asadi, 2009).

According to Article 143 of the *Islamic Penal Code*, criminal liability primarily applies to natural persons, but legal persons can also be held liable if their legal representative commits a crime in the name or interest of the legal entity. The law emphasizes that the criminal liability of a legal entity does not negate the liability of the natural person involved, and both can be held accountable.

### 8.2. Criminal Liability and Industrial Pollution in Iranian Law

The history of environmental legislation in Iran shows that the earliest laws, such as Articles 179 and 189 of the *Civil Code* (1930), the *Hunting Act* (1956), and the *Hunting and Fishing Act* (1967), addressed only natural environmental elements. However, the *Environmental Protection and Enhancement Act* (1974) was the first comprehensive law to cover all aspects of the environment and also influenced the structure of the Department of Environment (Shambayati, 2001).

Criminal liability for legal persons—particularly polluting industries and state-owned entities—in cases of environmental pollution is a complex issue. Acknowledging its significance, Iranian legislators emphasized such liability in laws like the *Environmental Protection and Enhancement Act* (Article 11) and implicitly in the *Islamic Penal Code* (Article 688). Chapter 25 of the Penal Code (*Ta'zirat*) addresses environmental crimes such as the destruction of natural resources, harm to wildlife, and pollution (as defined in Note 2 of Article 688).

Other specialized laws—including the *Air Pollution Prevention Act*, the *Hunting and Fishing Act*, the *Natural Resources and Forest Protection Act*, the *Radiation Protection Act*, and the *Clean Air Act* (focusing on financial penalties)—have established a comprehensive criminal framework for prosecuting environmental violations by legal entities. More recent laws, such as the *Sixth Development Plan Act* and the *Biosafety Act*, have also emphasized this responsibility.

The *Clean Air Act* assigns responsibilities to various agencies and institutions to monitor and reduce air pollution. Notably, Articles 6, 14, 16, 17, 20, and 29 explicitly state that individuals associated with pollution sources may face fines if they fail to comply with regulations. These fines serve as deterrents to encourage adherence to environmental standards. Additionally, Paragraph 31 of the *Sixth Development Plan Act* and the *Biosafety Act* emphasize the criminal liability of legal persons and the imposition of harsher penalties. These measures aim to reduce the adverse effects of air pollution on human health and the environment. Legislators seek to guide officials and industries toward effective pollution-reduction strategies and air quality improvement through financial sanctions, underscoring the importance of environmental protection and public health.

Article 11 of the *Environmental Protection and Enhancement Act* emphasizes penalties for legal persons committing environmental crimes. This provision reflects the legislature's awareness of the significant impact of legal entities—especially in the industrial sector—on ecosystems. Environmental crimes in large industries are often committed by public legal persons, requiring a special legislative approach. Although Article 688 of the *Islamic Penal Code* does not explicitly mention legal persons, the phrase “any act” can be interpreted to include them. Considering the state's ownership of numerous polluting

enterprises, it bears significant responsibility. The involvement of multiple government agencies further complicates the issue, as determining precise responsibility and legal consequences requires meticulous legal interpretation. This matter is critical, given its potential influence on environmental policy and public health.

Numerous laws and regulations address crimes threatening public health and environmental pollution. Article 688 of the *Islamic Penal Code* serves as a general provision in this field. These offenses typically arise from affirmative criminal acts rather than omissions. They are generally categorized as intentional crimes, with unintentional, quasi-intentional, or negligent occurrences being rare. Most such crimes are considered absolutely intentional, with a few being conditionally intentional.

Under Article 40 of the *Islamic Penal Code*, courts may postpone the sentencing of a person convicted of a crime against public health, since it is categorized as a level-6 offense. This indicates that the rule of delayed sentencing is also applicable to Article 688 offenses. Furthermore, Clause (t) of Article 105 of the Penal Code states that intentional public health offenses are subject to a statute of limitations, which is a matter of significant legal debate.

## 9. Challenges in the Realm of Criminal Liability

### 9.1. Requirement to Prove *Mens Rea* (Criminal Intent or Fault)

One of the primary challenges associated with criminal liability for environmental polluters is the necessity of proving *mens rea*, or criminal intent/fault. Demonstrating that an industrial unit acted knowingly or intentionally in causing pollution can be extremely difficult. While in some environmental offenses, the mere commission of the act (whether by action or omission) may suffice for establishing criminal responsibility (i.e., *strict liability* or *material-only* crimes), in many cases, the psychological element of the offense must be established.

### 9.2. The Severity of Penalties in Environmental Laws

Another challenge pertains to the adequacy of penalties prescribed by law. In some instances, penalties—especially monetary fines—may be negligible compared to the economic gain from polluting activities or the cost of complying with environmental regulations. If penalties lack sufficient deterrent power, they fail to serve their preventive function. Inflation and the devaluation of currency can further diminish the effectiveness of fines over time, unless mechanisms for their adjustment to economic conditions are provided.

### 9.3. Criminal Liability of Legal Entities

In developing societies, economic and industrial activities are often managed by corporations and legal entities, which contributes to the commission of various crimes and presents legal challenges for governments. Among these offenses, environmental violations have become a major concern in modern life. The *Islamic Penal Code* of Iran (enacted in 2013) explicitly recognizes the criminal liability of legal persons and outlines the conditions for such liability in Article 143. However, the effective implementation of this provision and the imposition of appropriate and deterrent sanctions on legal persons require robust judicial practice and sufficient expertise in adjudicating such cases.

### 9.4. Jurisdiction over Pollution-Related Claims

According to Article 159 of the *Constitution of the Islamic Republic of Iran*, the judiciary is designated as the authority for addressing complaints and claims, encompassing both civil and criminal matters to be adjudicated in relevant courts. Article 173 of the *Administrative Justice Court Act* also allows individuals to file complaints regarding actions taken by the government.

In environmental law, claims are generally divided into two categories: protective and compensatory. When industrial pollution causes harm to the public, affected individuals may file claims in general courts for compensation. In addition, the *Administrative Justice Court* enables individuals to challenge regulations and enactments that cause environmental harm and seek their annulment.

The *Clean Air Act* (2017) emphasizes the importance of adjudicating air pollution claims and envisions the establishment of specialized environmental courts. Unfortunately, this objective has yet to be realized. Under the *Environmental Protection and Enhancement Act*, the Department of Environment is authorized to issue warnings to polluting industries and, if necessary, shut them down. This enforcement can be carried out either by the organization's officers or through the judiciary and law enforcement.

Affected individuals may contest such warnings in public courts, which are required to issue expedited rulings. If the objection is upheld, the court will annul the warning; this decision is final. If not, the Department of Environment may proceed with enforcement.

Environmental crimes affecting public health are addressed in the *Ta'zirat* section of the *Islamic Penal Code*. Since no specific court is designated for these crimes, and other environmental statutes also lack a designated judicial body, jurisdiction lies with the general criminal courts (Kordi Shahdehi, 2017). Similarly, general civil courts are competent to hear civil environmental damage claims.

## 10. Civil and Criminal Liability: Conflict or Convergence

Despite their differences, civil and criminal liability share notable similarities in their constituent elements. Civil liability requires the existence of damage, a harmful act, a causal link between the act and the harm, and, under certain theories, proof of fault. In essence, the offender must have caused harm to another, through an unlawful act, resulting in damage attributable to the offender's conduct, and in some cases, fault must be established.

Conversely, criminal liability involves a codified offense, the commission of a prohibited act, proof of causation, and establishment of the mental element of the crime. This means the perpetrator must have committed an act that the legislature defines as criminal, the result of which must stem from that act, and the perpetrator must have criminal intent. These elements are comparable and can be analyzed together. For example, the *damage* element in civil liability may be likened to the *criminalized act* in criminal law; similarly, the unlawful harmful act and the mental element can be compared across both domains (Mohseni & Ansari, 2019).

In civil law, compensation for harm is the primary sanction. This compensation imposes a financial or restorative burden on the offender. In contrast, criminal penalties fall into two categories. The first includes externally imposed sanctions such as fines and corporal punishment. The second restricts freedoms granted by society, such as imprisonment. These sanctions are inherently punitive and may only be imposed by a judge, pursuant to Articles 36 and 37 of the Constitution (Shahidi et al., 2018).

It is important to recognize that environmental problems, including pollution and the destruction of natural resources, are global and international in nature and not confined to a few countries. Nations at different levels of development face diverse environmental challenges, and each country formulates and implements environmental policies and strategies according to its unique conditions and needs. In this context, international cooperation for the development of global environmental law—and the interaction between civil and criminal liability systems to prevent environmental pollution—is more critical than ever (Kordi Shahdehi, 2017).

### 10.1. Weak Enforcement and Oversight

Weakness in monitoring and enforcement is another major obstacle to the effectiveness of both civil and criminal liability systems. Even the most well-crafted laws will fail to meet their objectives, including prevention, if not properly implemented. The Department of Environment and other supervisory bodies may suffer from inadequate financial resources, a shortage of skilled personnel, and insufficient equipment for continuous monitoring of potentially polluting activities and detecting violations.

Moreover, lengthy judicial proceedings and enforcement issues may reduce the legal system's ability to respond swiftly and decisively to environmental offenses. This underscores the need for reform and clarification of existing laws, or the enactment of new legislation that explicitly outlines the interaction between civil and criminal liability in the context of environmental activities.

## 11. Conclusion

Preventing environmental pollution is one of the fundamental priorities for achieving sustainable development and preserving the quality of life for present and future generations. The Iranian legal system, through the dual mechanisms of civil and criminal liability, has sought to establish a framework for holding polluters accountable and deterring environmentally harmful conduct. Numerous laws have been enacted in this area, reflecting the legislator's awareness of its significance. However, an analysis of the feasibility of prevention through these legal instruments reveals that, despite the presence of legal capacities, several challenges limit their preventive effectiveness.

In the realm of civil liability, key obstacles include the difficulty of proving fault and causation under the traditional model, ambiguity regarding the full adoption of strict liability, challenges in the accurate and comprehensive valuation of environmental damage, and limitations in access to justice for all stakeholders (including the environment as a legal interest in itself). In the field of criminal liability, challenges arise from the requirement to establish *mens rea*, the inadequacy of some penalties in proportion to the severity of violations and the necessary deterrent effect, and complexities surrounding the criminal liability of legal persons.

Moreover, structural weaknesses in the environmental monitoring and enforcement system, coupled with insufficient financial and human resources, hinder the effective implementation of both categories of legal provisions. The feasibility of environmental pollution prevention in Iran through civil and criminal liability requires a realistic evaluation of the current capacities and limitations. Although the legal framework offers considerable potential through various legislative provisions, shortcomings in evidentiary standards, damage assessment, deterrence value of penalties, and especially in monitoring and enforcement, pose substantial obstacles to the full realization of preventive goals.

Overcoming these challenges necessitates strong political will, targeted legislative reform, strengthening of executive and judicial institutions, and active participation by civil society and the private sector. Without such measures, liability frameworks alone will be insufficient to curb the rising trend of environmental degradation. To enhance the preventive role of liability systems, it is essential to undertake legal reforms aimed at strengthening strict liability, simplifying proof requirements, making compensation more realistic, and revising penalties. Additionally, reinforcing supervisory and enforcement bodies, specializing judicial proceedings, and promoting environmental awareness are indispensable steps toward achieving practical pollution prevention. Ultimately, it must be acknowledged that civil and criminal liability alone are not enough and must be employed in conjunction with other legal, economic, and social tools to effectively protect the environment from pollution.

To increase the effectiveness of the liability system in preventing pollution, a comprehensive approach is necessary. Strengthening the foundations of strict liability in environmental damage cases—especially for high-risk activities—can enhance the incentive for potential polluters to take preventive measures. This requires revising and clarifying existing laws or enacting new legislation that explicitly provides for such liability in specified environmental activities.

In the criminal domain, reviewing the severity of penalties to align them with the importance of environmental protection and to enhance their deterrent capacity is crucial. Greater use of alternative sanctions to imprisonment—those with restorative and preventive functions, such as mandates for site cleanup, ecosystem restoration, or mandatory environmental education—could prove effective. Increasing penalties for repeat environmental offenses is also essential.

Strengthening criminal sanctions against legal entities, including penalties such as dissolution, prohibition from activity, or public disclosure of verdicts, can significantly enhance deterrence, especially for large corporations.

Specializing the adjudication of environmental claims and offenses through the creation of dedicated branches within courts or prosecutor's offices could improve the quality of judicial proceedings and lead to more precise and effective rulings.

Increasing the budget, resources, and independence of regulatory bodies like the Department of Environment is essential for monitoring, detecting violations, and pursuing civil and criminal cases against polluters.

Coordinated and complementary use of civil and criminal liability mechanisms is vital. In many cases, a single polluting act may give rise to both civil liability for damage compensation and criminal liability for punitive sanctions. Simultaneous pursuit of both forms of liability can exert greater pressure on polluters and send a stronger message that environmental violations will not be tolerated.

Promoting environmental culture and raising public awareness of the importance of pollution prevention and its legal consequences can serve as a supportive factor alongside legal tools. Informed citizens are more likely to contribute to environmental protection and to demand stricter enforcement from responsible authorities.

Environmental liability insurance can also play a complementary role in risk management and prevention. Requiring industries and high-risk activities to carry adequate insurance coverage can incentivize them to adopt more safety measures in order to reduce premium costs.

### Authors' Contributions

Authors contributed equally to this article.

### Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

### Ethical Considerations

All procedures performed in this study were under the ethical standards.

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### Conflict of Interest

The authors report no conflict of interest.

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